YORK BY JOHNSON CONTROLS	AIR-COOLED CONDENSING UNITS HERMETIC SCROLL	
INSTALLATION, OPERATION, MAINTENANCE	Supersedes: 150.63-NM5 (303)	Form 150.63-NM5 (711)

035-19331-000

YCUL0016E_ - YCUL0130E_
R22 & HFC - 407C
STYLE C
(60 HZ.)

29224(R)A

YCUL0016 – YCUL0090 EPROM (031-02050-001 MICROBOARD)

031-02049-001

YCUL0096 – YCUL0130 EPROM (031-02050-001 MICROBOARD)

031-02423-001

Metric Conversions

200-3-60
230-3-60
380-3-60
460-3-60
575-3-60
MODELS ONLY

Standard, Glycol & Metric Models, Combined

Issue Date:
July 27, 2011

IMPORTANT!
READ BEFORE PROCEEDING!

GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, oils, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that this individual possesses independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

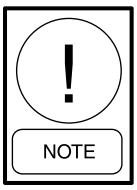
SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to areas of potential hazard:

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution. Usually an instruction will be given, together with a brief explanation.



NOTE is used to highlight additional information which may be helpful to you.

CHANGEABILITY OF THIS DOCUMENT

In complying with YORK's policy for continuous product improvement, the information contained in this document is subject to change without notice. While YORK makes no commitment to update or provide current information automatically to the manual owner, that information, if applicable, can be obtained by contacting the nearest YORK Engineered Systems Service office.

It is the responsibility of operating/service personnel to verify the applicability of these documents to the equipment in question. If there is any question in the mind of operating/service personnel as to the applicability of these documents, then prior to working on the equipment, they should verify with the owner whether the equipment has been modified and if current literature is available.

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PRODUCT IDENTIFICATION NUMBER (PIN)

BASIC MODEL NUMBER

YCUL0086EC 46XCA

1 2 3 4 BASE PRODUCT TYPE

- Y
- C
- A U
- L : Scroll

: YORK
: Chiller
: Air-Cooled
: Condensing Unit

5 6 7 8 NOMINAL CAPACITY

- 0 # # #
- 1 # # #

Even Number:
60 HZ Nominal Tons
Odd Number:
50 HZ Nominal kW

9 UNIT DESIGNATOR

- E : High Efficiency

10 REFRIGERANT

- C B : R-22
- B : R-407C

11 12 13 VOLTAGE/STARTER

11	12	13
1	7	: 200 / 3/ 60
2	8	: 230 / 3 / 60
4	0	: 380 / 3 / 60
4	6	: 460 / 3 / 60
5	0	: 380-415 / 3 / 50
5	8	: 575 / 3 / 60
		X : Across the Line

14 15 DESIGN/DEVELOPMENT LEVEL

- C
- A : Design Series A : Engineering Change or PIN Level

PRODUCT IDENTIFICATION NUMBER (PIN)

EXAMPLES:

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
X	X	X	X	X	X	X	X	X	L	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S	D	T	C	A	T	S	R	L	X	P	R	S	2	5	C	X	1	X	X	X	X	3	D	W	S	A	R	X	B	X	X	4	B	X	X	L	X	S	D

OPTIONS MODEL NUMBER

16 17 18 19 — POWER FIELD

- X X : Standard Power Option
- M D : MP NF Disconnects
- M B : MP Circuit Breakers
- S D : SP NF Disconnects
- S X : SP TB
- B X : SP Circuit Breaker
- S B : SP TB w/ Separate System Circuit Breakers
- D B : SP NF Disconnect w/ Separate System Circuit Breakers
- : Control Transformer (factory)
- : Power Factor Capacitor

MP = Multiple Point
SP = Single-Point
NF = Non-Fused
TB = Terminal Block
Ser. = Service
Ind. Sys. Brkr. & L. Ext. Handles = Individual System Breaker & Lockable External Handle

20 21 22 23 24 25 26 27 28 — CONTROLS FIELD

- L : Low Ambient Kit (factory)
- H : High Ambient Kit (factory)
- A : Both Low / High Ambient (factory)
- T : BAS/EMS Temp. Reset / Offset
- S : Spanish LCD & Keypad Display
- F : French LCD & Keypad Display
- G : German LCD & Keypad Display
- I : Italian LCD & Keypad Display
- R : Discharge Pressure readout required
- S : Suction Pressure readout required
- B : Discharge & Suction readouts required
- L : N. American Safety Code
- N : No Listing (typically 50 HZ non-CE,non-U.L.
- T : Suction Temp Sensor required
- C : Motor Current Module required
- R : Remote Control Panel required
- O : OptiView Remote Panel
- X

29 30 31 32 33 34 35 36 37 — COMPRESSOR / PIPING FIELD

- # # :
- C : Leaving Supply Temp.
- S : Chicago Code Kit Req'd.
- B : Service Isolation Valves
- X : Both Chicago & Svc. Iso.
- 1 :
- X : Hot Gas By-Pass req'd. (1 circuit)
- X : X
- X : X
- X : Crankcase Heater Std.

38 39 40 41 42 43 44 — EVAP. FIELD

- X
- X
- X
- X
- A : ASME Pressure Vessel Code
- X
- X

45 46 47 — CONDENSER FIELD

- X : Aluminum
- C : Copper
- B : Black Fin
- P : Phenolic
- X : TEAO Fan Motors

48 49 50 51 52 53 54 — CABINET FIELD

- X : Wire Condenser Headers Only (factory)
- 1 : Wire (Full Unit) Enc. Panels (factory)
- 2 : Wire (Full Unit) Enc. Panels (field)
- 3 : Wire/Louvered Enc. Panels (factory)
- 4 : Wire/Louvered Enc. Panels (field)
- 5 : Louvered (Cond. Only) Enc. Panels (factory)
- 6 : Louvered (Cond. Only) Enc. Panels (field)
- 7 : Louvered (Full Unit) Enc. Panels (factory)
- 8 : Louvered (Full Unit) Enc. Panels (field)
- B : Acoustic Sound Blanket
- L : Low Sound Fans
- 1 : 1" Deflection
- S : Seismic
- N : Neoprene Pads

55 — EXTENDED FIELD

- X : 1st Year Parts Only
- B : 1st Year Parts & Labor
- C : 2nd Year Parts Only
- D : 2nd Year Parts & Labor
- E : 5 Year Compressor Parts Only
- F : 5 Year Compressor Parts & Labor Only
- G : 5 Year Units Parts Only
- H : 5 Year Unit Parts & Labor

NOTES:
1. Q :DENOTES SPECIAL / S.Q.
2. # :DENOTES STANDARD
3. X :w/in OPTIONS FIELD, DENOTES NO OPTION SELECTED
4. Agency Files (i.e. U.L. / E.T.L.; CE; ARI; ETC.) will contain info. based on the first 14 characters only.

REFRIGERANT FLOW DIAGRAM

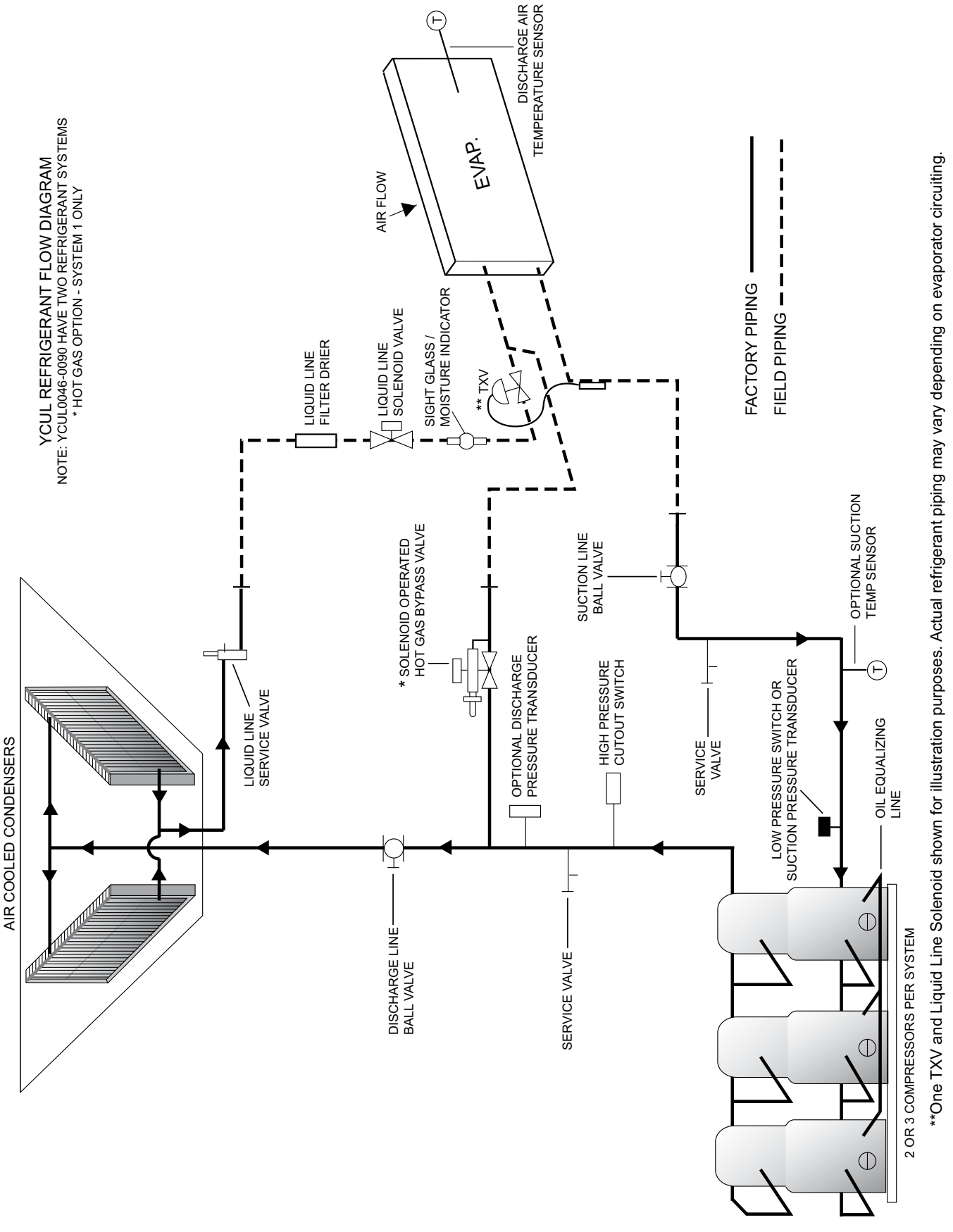

FIG. 1 – REFRIGERANT FLOW DIAGRAM

SPECIFICATIONS

GENERAL

The 15 - 130 Ton (53 - 457 kW) YCUL Condensing Unit Models are shipped complete from the factory ready for field installation.

The unit is pressure-tested, evacuated and given a nitrogen holding charge and includes an initial oil charge (R-22 or HFC-407C refrigerant supplied by others). After assembly, a operational test is performed to assure that each control device operates correctly.

The unit structure is heavy-gauge, galvanized steel. This galvanized steel is coated with baked-on powder paint, which, when subjected to ASTM B117 500 hour, salt spray testing, yields a minimum ASTM 1654 rating of "6". Units are designed in accordance with NFPA 70 (National Electric Code), ASHRAE/ANSI 15 Safety code for mechanical refrigeration, and are cETL listed. All units are produced at an ISO 9000-registered facility.

COMPRESSORS

The chiller has suction-gas cooled, hermetic, scroll compressors. The YCUL0016-0130 compressors incorporate a compliant scroll design in both the axial and radial direction. All rotating parts of the compressors are statically and dynamically balanced. A large internal volume and oil reservoir provides greater liquid tolerance. Compressor crankcase heaters are also included for extra protection against liquid migration.

CONDENSER

Coils – Fin and tube condenser coils of seamless, internally-enhanced, high-condensing-coefficient, corrosion resistant copper tubes are arranged in staggered rows, mechanically expanded into aluminum fins. Integral subcooling is included. The design working pressure of the coil is 450 PSIG (31 bar).

Fans – The condenser fans are composed of corrosion-resistant aluminum hub and glass-fiber-reinforced polypropylene composite blades molded into a low noise airfoil section. The are designed for maximum efficiency and are statically and dynamically balanced for vibration free operation. They are directly driven by independent motors, and positioned for vertical air discharge. The fan guards are constructed of heavy-gauge, rust-resistant, coated steel. All blades are statically and dynamically balanced for vibration-free operation.

Motors – The fan motors are Totally Enclosed Air-Over, squirrel-cage type, current protected. They feature ball bearings that are double-sealed and permanently lubricated.

REFRIGERANT CIRCUIT

One (YCUL0016-0040) or two (YCUL0046-0130) independent refrigerant circuits will be finished on each unit. All unit piping will be copper, with brazed joints. The liquid line will include a field connection shutoff valve with charging port located on each condenser circuit. Suction line connections are provided on each refrigeration circuit. A filter drier and sight glass are shipped loose for field installation on each refrigerant circuit.

All expansion valves, liquid line solenoid valves, refrigerant, and refrigerant field piping are supplied by others.

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SECTION 1 - INSTALLATION

WARNING

To ensure warranty coverage, this equipment must be commissioned and serviced by an authorized YORK service mechanic or a qualified service person experienced in chiller installation. Installation must comply with all applicable codes, particularly in regard to electrical wiring and other safety elements such as relief valves, HP cutout settings, design working pressures, and ventilation requirements consistent with the amount and type of refrigerant charge.

Lethal voltages exist within the control panels. Before servicing, open and tag all disconnect switches.

INSTALLATION CHECK LIST

The following items, 1 through 5, must be checked before placing the units in operation.

1. Inspect the unit for shipping damage.
2. Rig unit using spreader bars.
3. Open the unit only after piping is installed and evacuation in complete.
4. Pipe unit using good piping practice (refer to ASHRAE handbook).
5. Check to see that the unit is installed and operated within limitations (Refer to LIMITATIONS).

00096 (rig)VIP

The following pages outline detailed procedures to be followed to install and start-up the unit.

HANDLING

These condensing units are shipped as completely assembled units containing a nitrogen holding charge, but require field installation of a liquid line filter drier, TXV, liquid line solenoid, sight glass, refrigerant, discharge/return air temperature sensor (if used), and refrigerant piping to the air handling unit. Care should be taken to avoid damage due to rough handling.

The unit should be lifted by inserting hooks through the holes provided in unit base rails. Spreader bars must be used to avoid crushing the unit frame rails with the lifting chains. See below.

INSPECTION

Immediately upon receiving the unit, it should be inspected for possible damage which may have occurred during transit. If damage is evident, it should be noted in the carrier's freight bill. A written request for inspection by the carrier's agent should be made at once. See "Instruction" manual, Form 50.15-NM for more information and details.

LOCATION AND CLEARANCES

The YCUL Condensing Units are designed for outdoor installation. When selecting a site for installation, be guided by the following conditions:

1. For outdoor locations of the unit, select a place having an adequate supply of fresh air for the condenser.
2. Avoid locations beneath windows or between structures where normal operating sounds may be objectionable.
3. Installation sites may be either on the roof, or at ground level. (See FOUNDATION)
4. The condenser fans are the propeller-type, and are not recommended for use with duct work in the condenser air stream.
5. When it is desirable to surround the unit(s), it is recommended that the screening be able to pass the required chiller CFM without exceeding 0.1" of water external static pressure.

6. Protection against corrosive environments is available by supplying the units with either copper fin, cured phenolic, or epoxy coating on the condenser coils. The phenolic or epoxy coils should be offered with any units being installed at the seashore or where salt spray may hit the unit.

In installations where winter operation is intended and snow accumulations are expected, additional height must be provided to ensure normal condenser air flow.

Recommended clearances for units are given in DIMENSIONS. When the available space is less, the unit(s) must be equipped with the discharge pressure transducer option to permit high pressure unloading in the event that the air recirculation were to occur.

FOUNDATION

The unit should be mounted on a flat and level foundation, floor, or rooftop capable of supporting the entire operating weight of the equipment. See PHYSICAL DATA for operating weight. If the unit is elevated beyond the normal reach of service personnel, a suitable catwalk must be capable of supporting service personnel, their equipment, and the compressors.

GROUND LEVEL LOCATIONS

It is important that the units be installed on a substantial base that will not settle, causing strain on the refrigerant lines and resulting in possible leaks. A one-piece concrete slab with footers extending below the frost line is highly recommended. Additionally, the slab should not be tied to the main building foundation as noises will telegraph.

Mounting holes (11/16" diameter) are provided in the steel channel for bolting the unit to its foundation. See DIMENSIONS.

For ground level installations, precautions should be taken to protect the unit from tampering by or injury to unauthorized persons. Screws on access panels will prevent casual tampering; however, further safety precautions, such as unit enclosure options, a fenced-in enclosure, or locking devices on the panels may be advisable. Check local authorities for safety regulations.

ROOFTOP LOCATIONS

Choose a spot with adequate structural strength to safely support the entire weight of the unit and service personnel. Care must be taken not to damage the roof during installation. If the roof is “bonded”, consult the building contractor or architect for special installation requirements. Roof installations should incorporate the use of spring-type isolators to minimize the transmission of vibration into the building structure.

NOISE SENSITIVE LOCATIONS

Efforts should be made to assure that the unit is not located next to occupied spaces or noise sensitive areas where noise level would be a problem. The unit noise is a result of compressor and fan operation. Considerations should be made utilizing noise levels published in the YORK Engineering Guide for the specific unit model. Sound blankets for the compressors and low sound fans are available.

SPRING ISOLATORS (OPTIONAL)

When ordered, four (4) isolators will be furnished.

Identify the isolator, and locate at the proper mounting point, and adjust per instructions. See Appendix 1.

COMPRESSOR MOUNTING

The compressors are mounted on four (4) rubber isolators. The mounting bolts should not be loosened or adjusted at installation of the condensing unit.

ELECTRICAL WIRING

Field Wiring

Power wiring must be provided through a fused disconnect switch to the unit terminals (or optional molded disconnect switch) in accordance with N.E.C. or local code requirements. Minimum circuit ampacity and maximum dual element fuse size are given in the ELECTRICAL DATA tables.

A 120-1-60, 15 amp source must be supplied for the control panel through a fused disconnect when a control panel transformer (optional) is not provided. Refer to Table 7 and Figures 2 - 5.

See Figures 2 - 5 and unit wiring diagrams for field and power wiring connections. Refer to section on UNIT OPERATION for a detailed description of operation concerning unit contacts and inputs.

Liquid Line Solenoid Connections

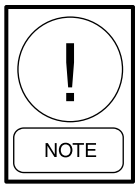
The field supplied and installed liquid line solenoid valves should be installed at the evaporator and wired using 18 AWG minimum wire. Electrical connections should be made at Terminal Board CTB3. CTB3 is located in the power panel on the left side of the power panel. **Note that power for the solenoid coil is 120 vac**. Refer to Figure 8 and unit wiring diagram.

DISCHARGE AIR SENSOR

The discharge air sensor and associated connector hardware is factory supplied but must be field installed. Field wire must be field supplied (QUABBIN 930421-2 or equivalent 2 conductor with shield and drain wire - 20 AWG 300 V 60°C - polyethylene insulation UV resistant). Field wiring is connected to pins 3, 6, and 9 of J6 on the microboard. Refer to Figure 9 and unit wiring diagram.

ZONE TERMOSTATS

Field supplied thermostats or dry contacts **must be field wired when operating the unit in Suction Pressure Control Mode**. The System 1 zone thermostat is field wired at CTB1 terminals 13 to 14. On two system units (YCUL0046 - YCUL0130) System 2 zone thermostat is field wired to CTB1 terminals 13 to 16. CTB 1 therminal is located near the bottom of the micro control panel. Refer to Figure 6 and unit wiring diagram.



See Air Proving Switch/Remote Start-Stop Contacts.

Suction Pressure control cannot be used unless the optional suction transducers are installed on the unit (standard on YCUL0076 - YCUL0130).

SUCTION TEMPERATURE SENSORS (OPTIONAL)

This is a field installed option that provides individual displays of suction line temperature for each system at the condensing unit. This option performs no control function, but simply provides the suction line temperature for each refrigerant system as measured at the condensing unit.

On the microboard, the connections are field wired to J5, pins 14, 9, & 4 for System 1; J5, pins 15,10 & 5 for System 2. Refer to Figure 10 and unit wiring diagram.

The sensors should be attached to the suction line with copper straps, and heat conducting compound should be used to ensure good heat transfer. Sensors should be mounted at the 4 an 8 o'clock positions.

Air Proving Switch/Remote Start-Stop Contacts

The air proving switch is field wired to CTB1 terminals13 to 14 (sys 1) and 13 to 16 (sys 2) to prevent operation of the refrigerant circuit when the supply air blower is not operating.

If separate evaporator blowers are used with respect to each refrigerant system in the condensing unit, then two air proving must be wired in series across CTB1 terminals 13 - 14 and 13 - 16 (one for each evaporator blower). Refer to Figure 6 and unit wiring diagram.

When using Zone Thermostats in Suction Pressure control mode, the air proving switch(s) should be wired in series with the respective Zone Thermostats.

Remote Start/Stop Contacts

To remotely start and stop the condensing unit, dry contacts can be wired in series with the air proving switch and CTB1 - terminals 13 to 14 (sys 1) and 13 to 16 (sys 2). Refer to Figure 6 and unit wiring diagram.

Remote Emergency Cutoff

Immediate shutdown of the condensing unit can be accomplished by opening a field installed dry contact to break the electrical circuit between terminals 5 to L on terminal block CTB2.CTB2 is located in the power panel.The unit is shipped with a factory jumper installed between terminals 5 to L, which must be removed if emergency shutdown contacts are installed. Refer to Figure 7 and unit wiring diagram.

Evaporator Blower Start Contacts

For constant fan operation: Terminal block CTB2 - terminals 23 to 24, are normally open contacts that can be used to switch field supplied power to provide a start signal to the evaporator blower contactor.
Refer to Figure 7 and unit wiring diagram.

Compressor Run Contacts

Contacts are available to monitor “Compressor Run” status. Normally-open auxiliary contacts from each compressor contactor are wired in parallel with CTB2 - terminals 25 to 26 for system 1, and CTB2 - terminals 27 to 28 for system 2 (YCUL0046 - YCUL00130).
Refer to Figure 7 and unit wiring diagram.

Alarm Status Contacts

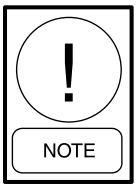
Normally-open contacts are available for each refrigerant system. These normally-open contacts close when the system is functioning normally. The respective contacts will open when the unit is shut down on a unit fault, or locked out on a system fault. Field connections are at CTB2 terminals 29 to 30 (sys 1), and terminals 31 to 32 (sys 2). Refer to Figure 7 and unit wiring diagram.

PWM INPUT

The PWM input allows reset of the discharge air temperature setpoint (when unit is programmed for Discharge Air Temperature Control mode) by supplying a "timed" contact closure. Field wiring should be connected to CTB1 - terminals 13 to 20. A detailed explanation is provided in the Unit Control section. Refer to Figure 6 and unit wiring diagram.

Load Limit Input

Load limiting is a feature that prevents the unit from loading beyond a desired value. The unit can be "load limited" either 33% or 66% on 3 or 6 compressor units, 50% on 2 or 4 compressor units, 40% or 80% on 5 compressor units, depending on the number of compressors on the unit.The field connections are wired to CTB1- terminals 13 to 21, and work in conjunction with the PWM inputs. A detailed explanation is provided in the Unit Control section. Refer to Figure 6 and unit wiring diagram.



When using the Load Limit feature, the PWM feature will not function - SIMULTANEOUS OPERATION OF LOAD LIMITING AND TEMPERATURE RESET (PWM INPUT) CANNOT BE DONE.

COMPRESSOR HEATERS

Compressor heaters are standard on all models. If power is OFF more than two hours, the crankcase heaters must be energized for 18-24 hours prior to restarting a compressor. This will assure that liquid slugging and oil dilution does not damage the compressors on start.

REFRIGERANT PIPING

General

When the unit has been located in its final position, the unit piping may be connected. Normal installation precautions should be observed in order to receive maximum operating efficiencies. System piping should conform to the York DX piping guide form 050.40ES2 or ASHRAE refrigeration handbook guidelines. All piping design and installation is the responsibility of the user.

YORK ASSUMES NO WARRANTY RESPONSIBILITY FOR SYSTEM OPERATION OR FAILURES DUE TO IMPROPER PIPING, PIPING DESIGN, CONTROL PROBLEMS, OR LACK OF OIL RETURN.

Filter driers and sight glasses are shipped loose for field installation on each refrigerant circuit. Field refrigerant piping can be connected to the condensing unit.
All expansion valves, liquid line solenoid valves, and refrigerant piping are field supplied and installed. TXV sizing should be equal in size or slightly smaller than the capacity of the circuit. If multiple coil sections are utilized, a TXV for each section, sized accordingly, must be installed.

Table 4 lists refrigerant line connections sizes per unit model number.

REFRIGERANT LINE SIZING

Refrigerant piping systems must be designed to provide practical line sizes without excessive pressure drops, prevent compressor oil from being "trapped" in the refrigerant piping, and ensure proper flow of liquid refrigerant to the thermal expansion valve. Considerations should be given to:

1. Suction line pressure drop due to refrigerant flow.
2. Suction line refrigerant velocity for oil return.
3. Liquid line pressure drop due to refrigerant flow.
4. Liquid line pressure drop (or gain) due to vertical rise of the liquid line.

Table 5 & 6 provides the pressure drops for given pipe sizes for both liquid and suction lines. The pressure drops given are per 100 ft. (30.5 m) of refrigerant piping. These friction losses do not include any allowances for strainer, filter drier, solenoid valve, isolation valve, or fittings.

Nominal pressure drop for solenoids, sight glass, and driers are shown in Table 2.

Table 1 includes approximate equivalent lengths for copper fittings.

To ensure a solid column of liquid refrigerant to the expansion valve, the total liquid line pressure drop should never exceed 40 psi (276 kPa). Refrigerant vapor in the liquid line will measurably reduce valve capacity and poor system performance can be expected.
To allow adequate oil return to the compressor, suction risers should be sized for a minimum of 1000 FPM (5.08 m/s) while the system is operating at minimum capacity to ensure oil return up the suction riser. Refer to Table 5 & 6 under column labeled "Nominal Tons (kW) Unloaded.

Evaporator Below Condensing Unit

On a system where the evaporator is located below the condensing unit, the suction line must be sized for both pressure drop and oil return. In many cases a double suction riser must be installed to ensure reliable oil return at reduced loads. Table 5 & 6 indicates when a double suction riser should be used for listed pipe sizes to provide adequate oil return at reduced loads. The calculated information was based on maintaining a minimum of 1000 fpm (5.08 m/s) refrigerant vapor velocity at full load.

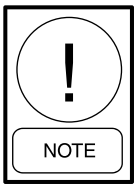
Condenser Below Evaporator

When the condensing unit is located below the evaporator, the liquid line must be designed for both friction loss and static head loss due the vertical rise. The value of static head loss of 5 psi/ft.(3.4 kPa/30 cm) must be added to the friction loss pressure drop in addition to all pressure drops due to driers, valves, etc.

OIL TRAPS

All horizontal suction lines should be pitched at least 1/4" per foot (2 cm/m) in the direction of the refrigerant flow to aid in the return of oil to the compressor. All suction lines with a vertical rise exceeding 3 feet (.91 meters) should have a "P" trap at the bottom and top of the riser to facilitate oil return. Suction lines with a vertical rise exceeding 25 feet (7.6 meters) should be trapped every 15 feet (4.6 meters).

For more details, refer to ASHRAE Refrigeration Handbook. System Practices for Halocarbon Refrigerants.



On systems where oil return is a problem, oil separators may be required. However, if piping design is poor, even with a separator, oil may be lost into the system over time, which may cause compressor failure.

REFRIGERANT CHARGE

The condensing unit is charged with nitrogen a holding charge. The operating charge for the condensing unit, evaporator coil, and refrigerant piping must be "weighed-in" after all refrigerant piping is installed, leak checked, and evacuated.

70% of the calculated charge must be added prior to starting a system . Failure to add 70% of the charge may cuase compressor overheating when the system is first started.

Final adjustment of refrigerant charge should be verified by subcooling values (refer to section on Pre-Startup for checking subcooling). See Table 3 for Refrigerant Line Charges.

FILTER DRIERS/ SIGHT GLASSES/ TXV'S

Liquid line filter driers, sight glass, and TXV's are field supplied for each refrigerant circuit.

REFRIGERANT PIPING REFERENCE

For more details, refer to ASHRAE Refrigeration Handbook, Chapter 2.

TABLE 1 – FITTING EQUIVALENT LENGTHS

***COPPER FITTING EQUIVALENT LENGTHS**

LINE SIZE O.D.	SHORT-RADIUS ELL	LONG-RADIUS ELL
3/4" (19mm)	6.5 ft. (2m)	4.5 ft. (1.4m)
7/8" (22mm)	7.8 ft. (2.4m)	5.3 ft. (1.6m)
1-1/8" (29mm)	2.7 ft. (.8m)	1.9 ft. (.6m)
1-3/8" (35mm)	3.2 ft. (1m)	2.2 ft. (.7m)
1-5/8" (41mm)	3.8 ft. (1.2m)	2.6 ft. (8m)
2-1/8" (54mm)	5.2 ft. (1.6m)	3.4 ft. (1m)
2-5/8" (67mm)	6.5 ft. (20m)	4.2 ft. (1.3m)

TABLE 2 – MISCELLANEOUS LIQUID LINE PRESSURE DROPS

*MISCELLANEOUS LIQUID LINE PRESSURE	
SOLENOID VALVE	2 TO 3 PSI (13.8 TO 20.7 kPa)
FILTER/DRIER	2 TO 3 PSI (13.8 TO 20.7 kPa)
SIGHT GLASS	0.5 PSI (3.4 kPa)

* Pressure drops or equivalent length values are approximate. If more precise value is desired, consult ASHRAE Refrigerant Handbook.

TABLE 3 – REFRIGERANT PIPING CHARGES

REFRIGERANT LINE CHARGES			
SUCTION LINES		LIQUID LINES	
1-3/8" (35mm)	.2 oz./ft. (6 grams/30cm)	3/4" (19mm)	2.7 oz./ft. (76 grams/30cm)
1-5/8" (41mm)	.3 oz./ft. (8 grams/30 cm)	7/8" (22mm)	3.7 oz./ft. (105 grams/30cm)
2-1/8" (54mm)	.6 oz/ft. (17 grams/30cm)	1-1/8" (29mm)	6.2 oz./ft. (176 grams/30cm)
2-5/8" (67mm)	.8 oz./ft. (23 grams/30cm)	1-3/8" (35mm)	8.6 oz./ft. (244 grams/30cm)

* Pressure drops or equivalent length values are approximate. If more precise value is desired, consult either the York DX Piping Guide (form 050.40-ES2) or ASHRAE Refrigerant Handbook.

TABLE 4 – REFRIGERANT LINE CONNECTIONS

YCUL REFRIGERANT LINE CONNECTIONS					
MODEL YCUL	**SUCTION**	**LIQUID**	**MODEL YCUL**	**SUCTION**	**LIQUID**
0016	1-3/8"	7/8"	0076	2-1/8"	1-1/8"
0026	1-5/8"	7/8"	0080	2-1/8"	1-1/8"
0030	2-1/8"	7/8"	0086	2-5/8"	1-1/8"
0036	2-1/8"	7/8"	0090	2-5/8"	1-1/8"
0040	2-1/8"	7/8"	0096	2-5/8"	1-1/8"
0046	2-1/8"	7/8"	0100	2-5/8"	1-3/8"
0050	2-1/8"	7/8"	0106	2-5/8"	1-3/8"
0056	2-1/8"	7/8"	0120	2-5/8"	1-3/8"
0060	2-1/8"	7/8"	0130	2-5/8"	1-3/8"
0066	2-1/8"	1-1/8"			

TABLE 5 – REFRIGERANT LINE PRESSURE DROPS (ENGLISH)

MODEL NUMBER YCUL00	SYSTEM NUMBER	[1]NOMINAL TONS	SUCTION LINE				LIQUID LINE	
			COPPER TYPE L INCHES O.D.	[2]PRESSURE DROP PSI/100 FT.	VELOCITY @NOMINAL CAPACITY IN FPM at "Full Load"	[4]NOMINAL TONS UNLOADED	COPPER TYPE L INCHES O.D.	[3]PRESSURE DROP PSI/100 FT.
16	1	15	1-5/8	2.5	2400	7.5	3/4	4.5
			[5]2-1/8	.6	1350		7/8	2.1
26	1	20	1-5/8	4.3	3200	10	3/4	7.7
			[5]2-1/8	1.1	1800		7/8	3.5
30	1	27	1-5/8	7.4	4320	13	7/8	6.1
			2-1/8	1.9	2430		1-1/8	1.7
36	1	31	2-1/8	2.4	2790	15	7/8	7.9
			[5]2-5/8	0.7	1860		1-1/8	2.2
40	1	39	2-1/8	3.7	3510	13	1-1/8	3.4
			[5]2-5/8	1.3	2340		1-3/8	1.3
46	1	21	1-5/8	4.7	3360	10	3/4	8.4
			[5]2-1/8	1.2	1890		7/8	3.8
	2	21	1-5/8	4.7	3360	10	3/4	8.4
			[5]2-1/8	1.2	1890		7/8	3.8
56	1	27	1-5/8	7.4	4320	13	7/8	6.1
			2-1/8	1.9	2430		1-1/8	1.7
	2	27	1-5/8	7.4	4320	13	7/8	6.1
			2-1/8	1.9	2430		1-1/8	1.7
60	1	30	2-1/8	2.3	2700	15	7/8	7.4
			[5]2-5/8	.8	1800		1-1/8	3.8
	2	27	1-5/8	7.4	4320	13	7/8	6.1
			2-1/8	1.9	2430		1-1/8	1.7
66	1	31	2-1/8	2.4	2790	15	7/8	7.9
			[5]2-5/8	.9	1860		1-1/8	2.2
	2	31	2-1/8	2.4	2790	15	7/8	7.9
			[5]2-5/8	.9	1860		1-1/8	2.2

See notes on page 23.

TABLE 5 – REFRIGERANT LINE PRESSURE DROPS (ENGLISH)

MODEL NUMBER YCUL00	SYSTEM NUMBER	[1]NOMINAL TONS	SUCTION LINE				LIQUID LINE	
			COPPER TYPE L INCHES O.D.	[2]PRESSURE DROP PSI/100 FT.	VELOCITY @NOMINAL CAPACITY IN FPM at "Full Load"	[4]NOMINAL TONS UNLOADED	COPPER TYPE L INCHES O.D.	[3]PRESSURE DROP PSI/100 FT.
76	1	40	2-1/8	3.9	3600	13	1-1/8	3.6
			[5]2-5/8	1.4	2400		1-3/8	1.4
	2	31	[5]2-1/8	2.4	2790	10	7/8	7.9
			[5]2-5/8	.9	1860		1-1/8	2.2
80	1	39	2-1/8	3.7	3510	13	1-1/8	3.4
			[5]2-5/8	1.3	2340		1-3/8	1.3
	2	39	2-1/8	3.7	3510	13	1-1/8	3.4
			[5]2-5/8	1.3	2340		1-3/8	1.3
86	1	45	2-1/8	4.9	4050	15	1-1/8	4.4
			[5]2-5/8	1.7	2700		1-3/8	1.7
	2	39	2-1/8	3.7	3510	13	1-1/8	3.4
			[5]2-5/8	1.3	2340		1-3/8	1.4
90	1	45	2-1/8	4.9	4050	15	1-1/8	4.4
			[5]2-5/8	1.7	2700		1-3/8	1.7
	2	45	2-1/8	4.9	4050	15	1-1/8	4.4
			[5]2-5/8	1.7	2700		1-3/8	1.7
96	1	50	2 5/8	2.1	3000	25	5.4	5.4
			3 1/8	0.9	2200		2.1	2.1
	2	41	2 1/8	4.1	3690	20	3.7	3.7
			2 5/8	1.4	2460		1.4	1.4
100	1	49	2 5/8	2	2940	25	5.2	5.2
			3 1/8	0.9	2156		2	2
	2	49	2 5/8	2	2940		5.2	5.2
			3 1/8	0.9	2156		2	2
106	1	59	2 5/8	2.8	3540	20	7.3	7.3
			3 18	1.2	2596		2.8	2.8
	2	50	2 5/8	2.1	3000	25	5.4	5.4
			3 1/8	0.9	2200		2.1	2.1
120	1	61	2 5/8	3	3660	20	7.8	7.8
			[5] 3 1/8	1.3	2684		3	3
	2	61	2 5/8	3	3660		7.8	7.8
			[5] 3 1/8	1.3	2684		3	3
130	1	74	2 5/8	4.3	4440	25	4.3	4.3
			3 1/8	1.9	3256		1.6	1.6
	2	60	2 5/8	2.9	3600	20	7.6	7.6
			[5] 3 1/8	1.3	2640		2.9	2.9

See notes on page 23

TABLE 6 – REFRIGERANT LINE PRESSURE DROPS (METRIC)

MODEL NUMBER YCUL00	SYSTEM NUMBER	[1]NOMINAL KW	SUCTION LINE				LIQUID LINE	
			COPPER TYPE L INCHES O.D.	[2]PRESSURE DROP kPa/30.5 m	VELOCITY @NOMINAL CAPACITY IN M/S at "Full Load"	[4]NOMINAL KW UNLOADED	COPPER TYPE L INCHES O.D.	[3]PRESSURE DROP kPa/30.5 m
16	1	53	1-5/8	17.2	12.2	26	3/4	31.0
			[5]2-1/8	4.1	6.9		7/8	14.5
26	1	70	1-5/8	29.6	16.2	35	3/4	53.0
			[5]2-1/8	7.6	9.1		7/8	24.1
30	1	95	1-5/8	51.0	21.9	46	7/8	42.1
			2-1/8	13.0	12.3		1-1/8	11.7
36	1	109	2-1/8	16.5	14.2	53	7/8	54.5
			[5]2-5/8	4.8	9.4		1-1/8	15.2
40	1	137	2-1/8	25.5	17.8	46	1-1/8	23.4
			[5]2-5/8	9.0	11.9		1-3/8	9.0
46	1	74	1-5/8	32.4	17.1	35	3/4	58.0
			[5]2-1/8	8.3	9.6		7/8	26.2
	2	74	1-5/8	32.4	17.1	35	3/4	58.0
			[5]2-1/8	8.3	9.6		7/8	26.2
56	1	95	1-5/8	51.0	21.9	46	7/8	42.
			2-1/8	13.1	12.3		1-1/8	11.7
	2	95	1-5/8	51.0	21.9	46	7/8	42.1
			2-1/8	13.1	12.3		1-1/8	11.7
60	1	106	2-1/8	15.6	13.7	53	7/8	51.0
			[5]2-5/8	5.5	9.1		1-1/8	26.2
	2	95	1-5/8	51.0	21.9	46	7/8	42.1
			2-1/8	13.1	12.3		1-1/8	11.7
66	1	109	2-1/8	16.5	14.2	53	7/8	54.5
			[5]2-5/8	6.2	9.4		1-1/8	15.2
	2	109	2-1/8	16.5	14.2	53	7/8	54.5
			[5]2-5/8	6.2	9.4		1-1/8	15.2

See notes on page 23.

TABLE 6 – REFRIGERANT LINE PRESSURE DROPS (METRIC)

MODEL NUMBER YCUL00	SYSTEM NUMBER	[1]NOMINAL KW	SUCTION LINE				LIQUID LINE	
			COPPER TYPE L INCHES O.D.	[2]PRESSURE DROP kPa/30.5 m	VELOCITY @NOMINAL CAPACITY IN M/S at "Full Load"	[4]NOMINAL KW UNLOADED	COPPER TYPE L INCHES O.D.	[3]PRESSURE DROP kPa/30.5 m
76	1	141	2-1/8	26.9	18.3	46	1-1/8	24.8
			[5]2-5/8	9.7	12.2		1-3/8	9.7
	2	109	[5]2-1/8	16.5	14.2	35	7/8	54.5
			[5]2-5/8	6.2	9.4		1-1/8	15.2
80	1	137	2-1/8	25.5	17.8	46	1-1/8	23.4
			[5]2-5/8	9.0	11.9		1-3/8	9.0
	2	137	2-1/8	25.5	17.8	46	1-1/8	23.4
			[5]2-5/8	9.0	11.9		1-3/8	9.0
86	1	158	2-1/8	33.8	20.6	53	1-1/8	30.3
			[5]2-5/8	11.7	13.7		1-3/8	11.7
	2	137	2-1/8	25.5	17.8	46	1-1/8	23.4
			[5]2-5/8	9.0	11.9		1-3/8	9.7
90	1	158	2-1/8	33.8	20.6	53	1-1/8	30.3
			[5]2-5/8	11.7	13.7		1-3/8	11.7
	2	158	2-1/8	33.8	20.6	53	1-1/8	30.3
			[5]2-5/8	11.7	13.8		1-3/8	11.7
96	1	175.7	2 5/8	14.5	15.2	87.9	1 1/8	37.2
			3 1/8	6.2	11.2		1 3/8	14.5
	2	144.1	2 1/8	28.3	18.7	70.3	1 1/8	25.5
			2 5/8	9.7	12.5		1 3/8	9.7
100	1	172.2	2 5/8	13.8	15	70.3	1 1/8	35.9
			3 1/8	6.2	11		1 3/8	13.8
	2	172.2	2 5/8	13.8	15	70.3	1 1/8	35.9
			3 1/8	6.2	11		1 3/8	13.8
106	1	207.4	2 5/8	19.3	18	70.3	1 1/8	50.3
			3 18	8.3	13.2		1 3/8	19.3
	2	175.7	2 5/8	14.5	15.2	87.9	1 1/8	37.2
			3 1/8	6.2	11.2		1 3/8	14.5
120	1	214.4	2 5/8	20.7	18.6	70.3	1 1/8	53.8
			[5] 3 1/8	9.0	13.6		1 3/8	20.7
	2	214.4	2 5/8	20.7	18.6		1 1/8	53.8
			[5] 3 1/8	9.0	13.6		1 3/8	20.7
130	1	260.1	2 5/8	29.6	22.6	87.9	1 3/8	29.6
			3 1/8	13.1	16.5		1 5/8	11.0
	2	210.9	2 5/8	20.0	18.3	70.3	1 1/8	52.4
			[5] 3 1/8	9.0	13.4		1 38	20.0

See notes on page 23.

REFRIGERANT PIPING NOTES

1. Based on R-22 at the nominal capacity of the unit or system, an ambient temperature of 95°F (35°C) and a suction temperature of 45°F (7.2 °C).

2. Suction line sizes were calculated based on a nominal maximum pressure drop of 3 PSI/100 ft. (20.7kPa30.5m) .Whencalculating suction line pressure drop for a specific application, it should be noted that system capacity decreases as suction line pressure drop increases.

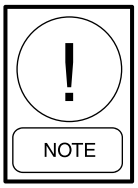
3. Liquid pressure drop (or gain) due to a vertical liquid line is not included in the tables and must be taken into account when determining pressure drop (or gain) of the liquid line. The nominal value that must be included in the liquid line loss (or gain) is .5 PSI/foot (3.4 kPa/30 cm) of rise (or gain). To ensure a solid column of liquid refrigerant to the expansion valve, the total maximum pressure drop of the liquid line should not exceed 40 PSI (276 kPa) based on 15°F (8.3 °C) subcooled liquid. Vapor in the liquid line, even in small amounts, will measurably reduce valve capacity and poor system performance will result. In addition, pressure loss for strainers, filter driers, solenoid valves, and isolation valve or fittings are not included in this table, and must be taken into account.

4. Nominal Tons (KW) Unloaded is based on one compressor (per system) operating at design conditions.

5. Based on minimum compressor staging for the given pipe size, a double suction riser should be used to ensure proper oil return to the compressor on all vertical suction risers. Oil returning up the riser moves up the inner surface of the pipe and depends on the mass velocity of the refrigerant vapor at the wall surface to move the oil up the vertical rise. Using piping of this size will allow velocities at part load to fall below 1000 fpm (5.08 m/s) minimum required for oil return.

6. Hot gas bypass lines are typically 7/8" for lines up to 40 feet and 1-1/8" for lines over 40 feet (12 meters) in length. The field connections sizes are 7/8" for the optional factory mounted hot gas bypass valve.

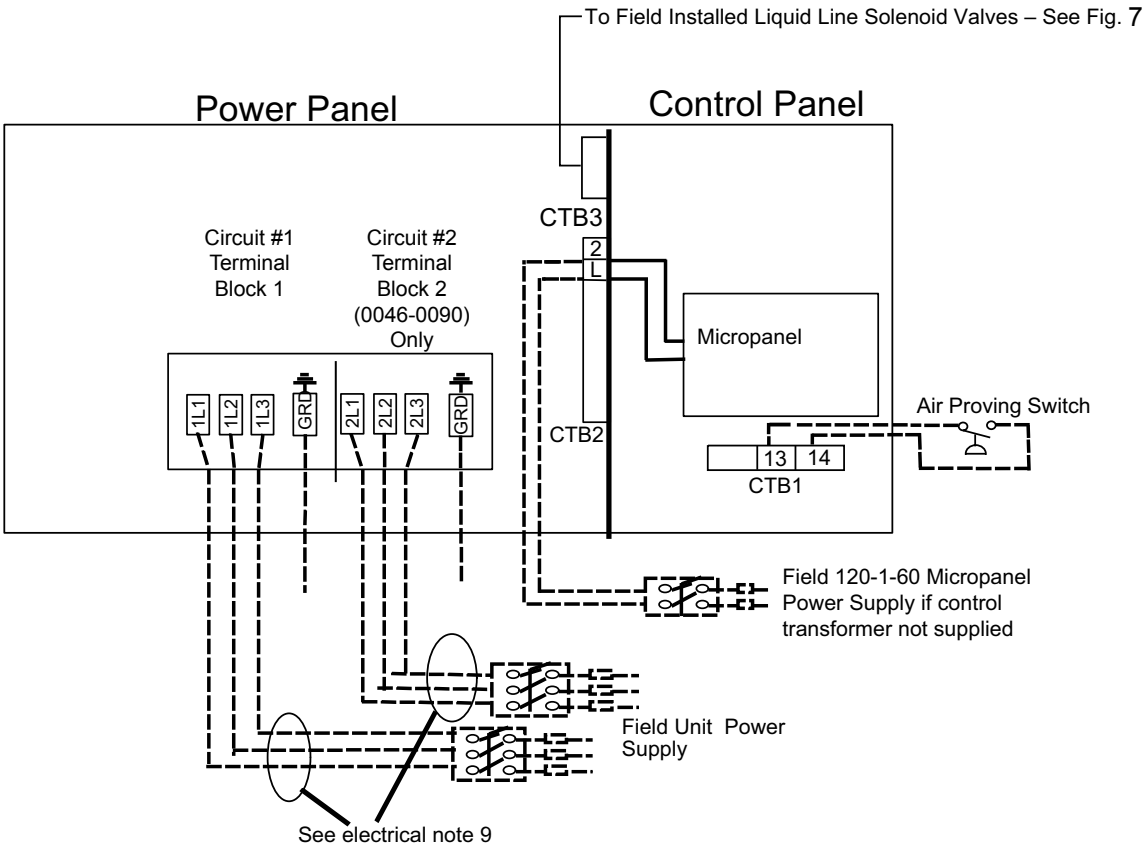
7. For more information, please refer to either the York DX Piping Application Guide or the ASHRAE Refrigertion Handbook.



Hot gas bypass is only available for refrigerant system number 1.

MULTI POINT POWER SUPPLY WIRING – (0016 - 0090)

(TERMINAL BLOCK)



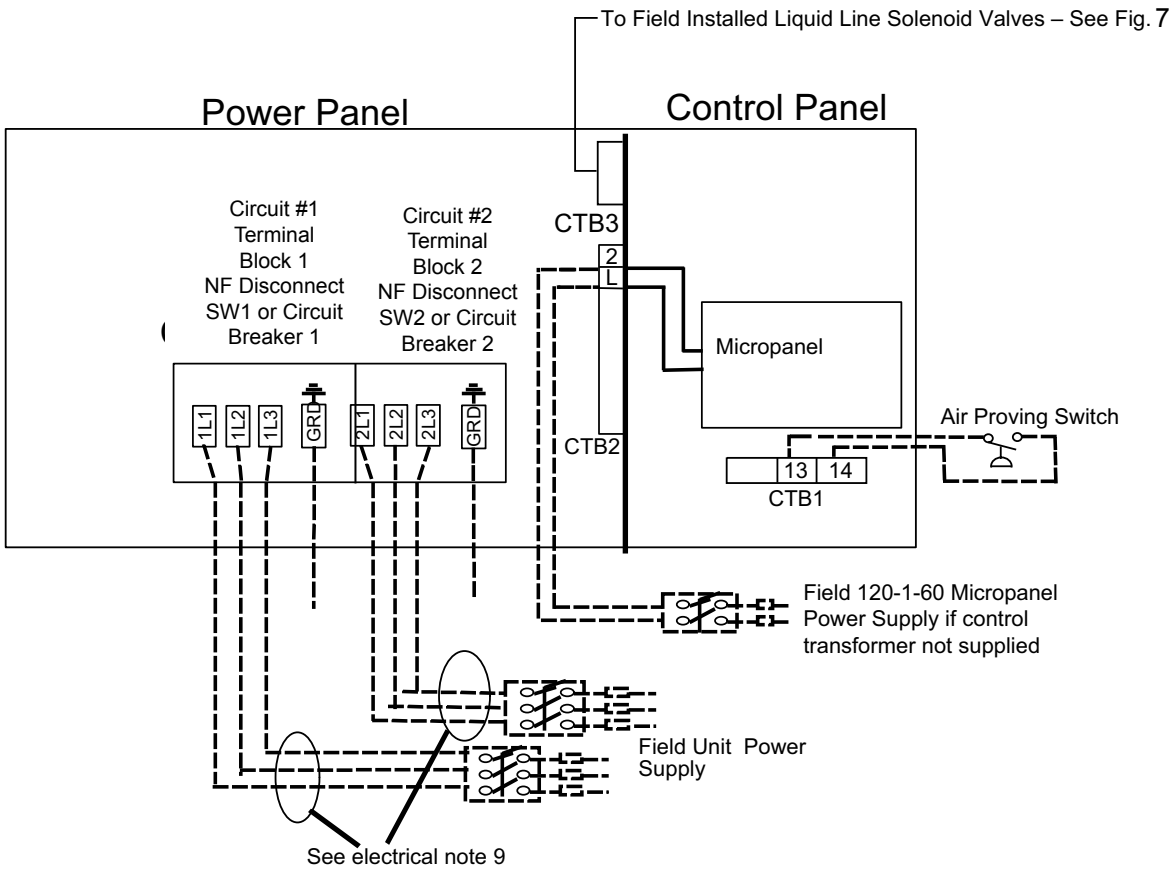
It is possible that multiple sources of power can be supplying the unit power panel. To prevent serious injury or death, the technician should verify that NO LETHAL VOLTAGES are present inside the panel AFTER disconnecting power, PRIOR to working on equipment.

Electrical Notes and Legend located on Pages 40.

FIG. 2 – MULTI POINT POWER SUPPLY WIRING

MULTI POINT POWER SUPPLY WIRING – (0096 - 0130)

(TERMINAL BLOCK, NON-FUSED DISCONNECT SWITCHES OR CIRCUIT BREAKERS)

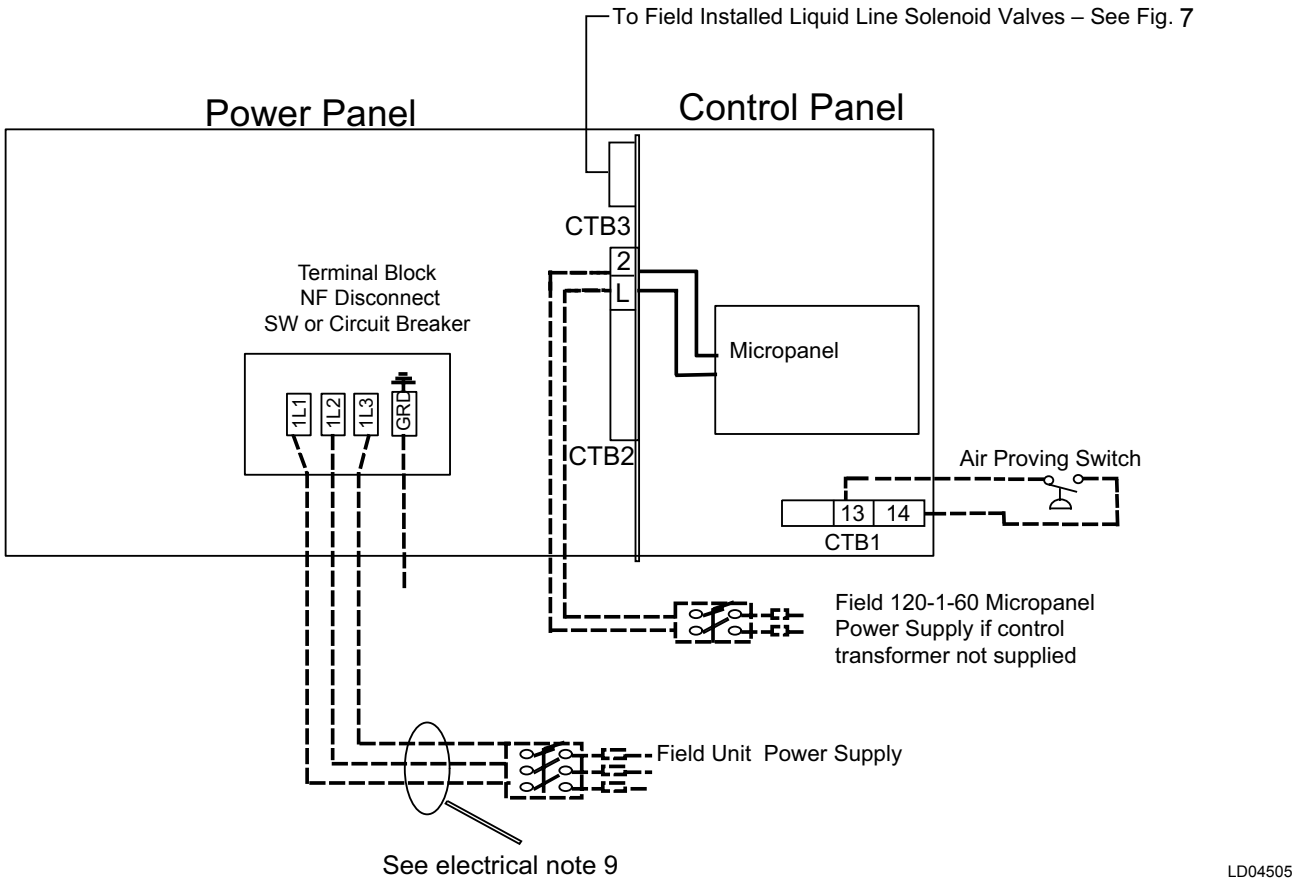


It is possible that multiple sources of power can be supplying the unit power panel. To prevent serious injury or death, the technician should verify that NO LETHAL VOLTAGES are present inside the panel AFTER disconnecting power, PRIOR to working on equipment.

Electrical Notes and Legend located on Pages 40.

FIG. 3 – MULTI POINT POWER SUPPLY WIRING

SINGLE POINT POWER SUPPLY WIRING – (0016 - 0090)
(TERMINAL BLOCK, NON FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER)

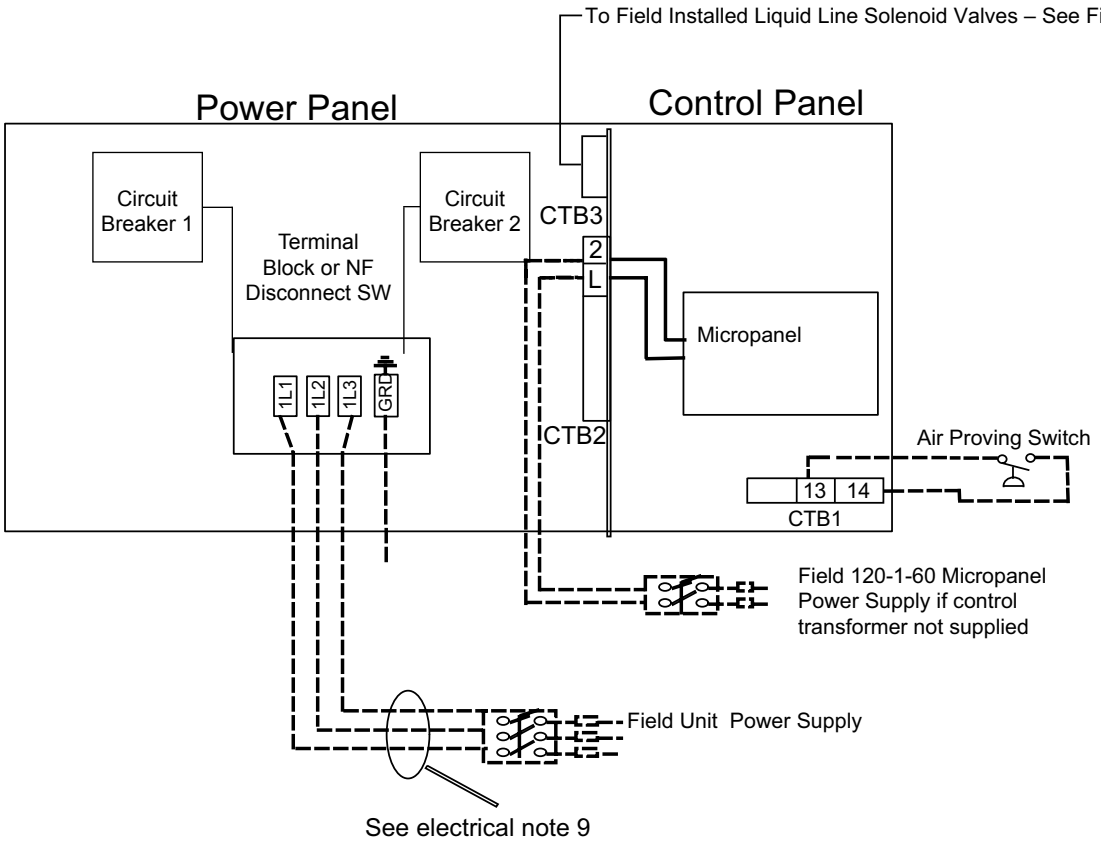


It is possible that multiple sources of power can be supplying the unit power panel. To prevent serious injury or death, the technician should verify that NO LETHAL VOLTAGES are present inside the panel AFTER disconnecting power, PRIOR to working on equipment.

Electrical Notes and Legend located on Pages 40.

FIG. 4 – SINGLE POINT POWER SUPPLY WIRING

SINGLE POINT POWER SUPPLY WIRING – (0016 - 0130)
(TERMINAL BLOCK, NON FUSED DISCONNECT SWITCH, CIRCUIT BREAKERS WITH INDIVIDUAL SYSTEM)



It is possible that multiple sources of power can be supplying the unit power panel. To prevent serious injury or death, the technician should verify that NO LETHAL VOLTAGES are present inside the panel AFTER disconnecting power, PRIOR to working on equipment.

Electrical Notes and Legend located on Pages 40.

FIG. 5 – SINGLE POINT POWER SUPPLY WIRING

CONTROL WIRING

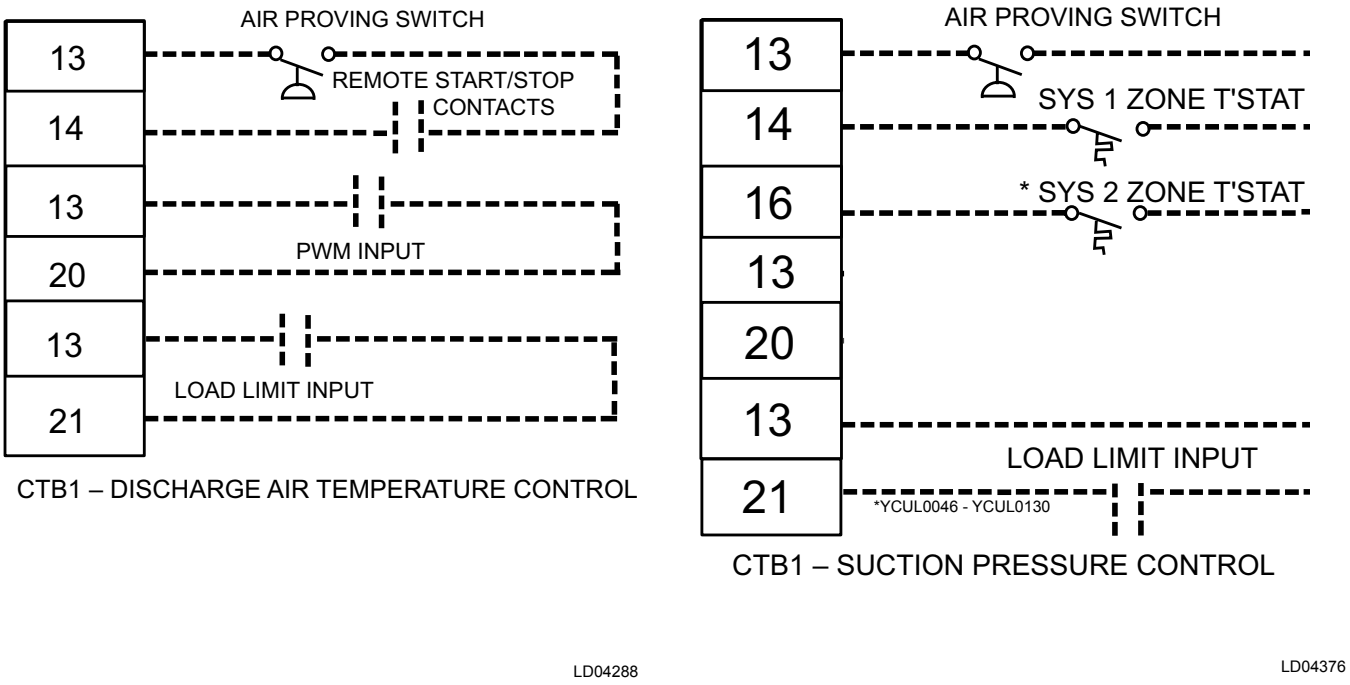
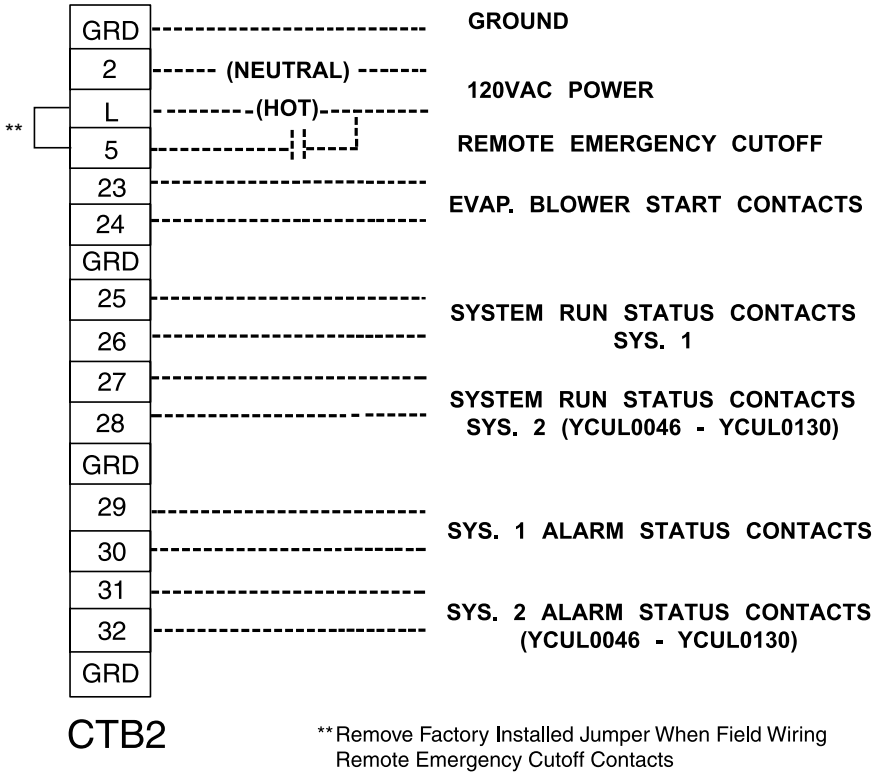


FIG. 6 – CTB1 FIELD CONTROL WIRING (CTB1 LOCATED BELOW MICROPROCESSOR BOARD)

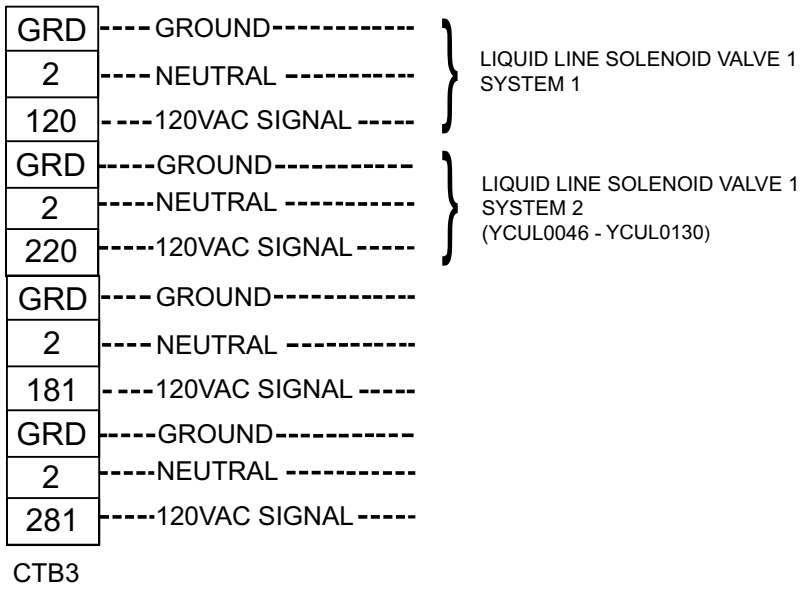
It is possible that multiple sources of power can be supplying the unit power panel. To prevent serious injury or death, the technician should verify that NO LETHAL VOLTAGES are present inside the panel AFTER disconnecting power, PRIOR to working on equipment.

CONTROL WIRING



LD08663

FIG. 7 – CTB2 POWER PANEL FIELD WIRING



LD04290

FIG. 8 – CTB3 POWER PANEL FIELD WIRING

WARNING

It is possible that multiple sources of power can be supplying the unit power panel. To prevent serious injury or death, the technician should verify that NO LETHAL VOLTAGES are present inside the panel AFTER disconnecting power, PRIOR to working on equipment.

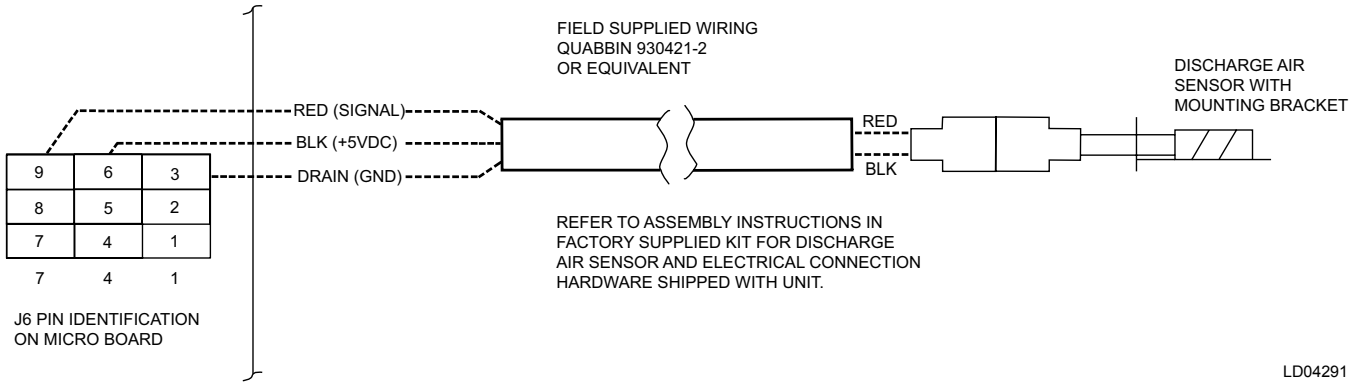
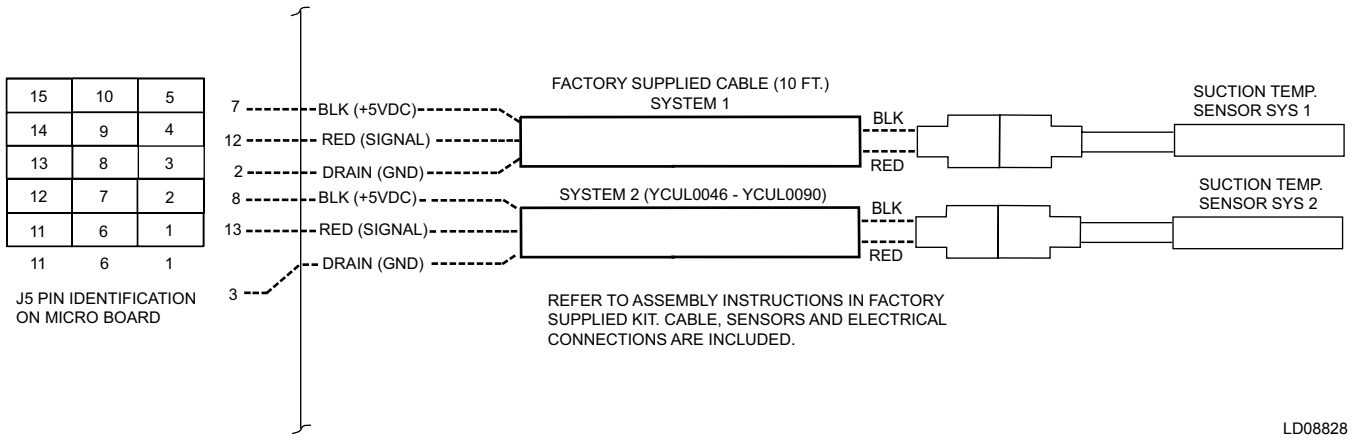
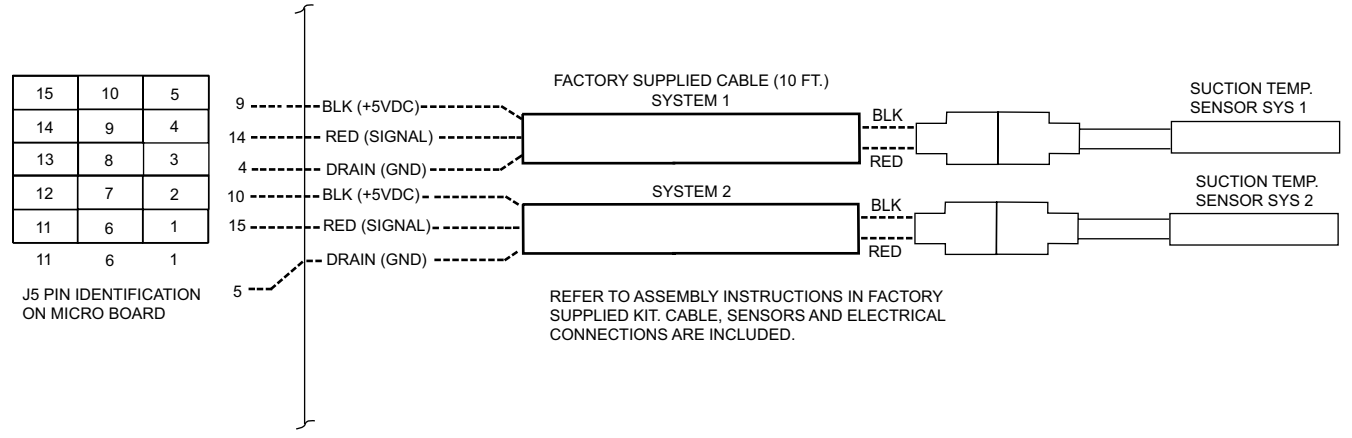


FIG. 9 – DISCHARGE AIR SENSOR FIELD WIRING



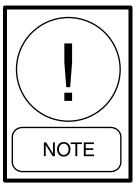
YCUL0016-YCUL0090



YCUL0096-YCUL0130

FIG. 10 – OPTIONAL SUCTION TEMPERATURE SENSOR FIELD WIRING

ELECTRICAL DATA



For YCUL0140 model wiring diagrams, refer to 150.63-NM5. Diagrams for YCUL0120-YCUL0130 also apply to YCUL0140.

SINGLE-POINT POWER SUPPLY CONNECTIONS – YCUL0016E_ - YCUL0040E_

(One Field Provided Power Supply to the chiller. Field connections to Factory Provided Power Terminal Block (standard), Non-Fused Disconnect Switch (optional) or Circuit Breaker (optional).)

TABLE 7 – SINGLE-POINT POWER SUPPLY

MODEL YCUL	VOLT	HZ	SINGLE POINT FIELD SUPPLIED WIRING									SYSTEM #1 COMPRESSOR & FAN							
			MCA[1]	MIN N/F DISC SW[2]	D.E. FUSE		CKT. BKR.[5]		INCOMING (LUGS) WIRE RANGE[6]			COMPR. #1		COMPR. #2		COMPR. #3		FANS	
					MIN[3]	MAX[4]	MIN	MAX	TERMINAL BLOCK (std)	NF DISC. SWITCH (opt)	CIRCUIT BREAKER (opt)	RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)
0016	200	60	81	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	28.3	189	28.3	189	—	—	2	8.2
	230	60	75	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	26.2	189	26.2	189	—	—	2	7.8
	380	60	44	60	50	50	50	50	# 10 - # 1	# 14 - 1/0	# 14 - 2	15.1	112	15.1	112	—	—	2	4.8
	460	60	37	60	40	45	40	45	# 10 - # 1	# 14 - 1/0	# 14 - 2	12.5	99	12.5	99	—	—	2	4.0
	575	60	29	60	35	35	35	35	# 10 - # 1	# 14 - 1/0	# 14 - 2	10.0	74	10.0	74	—	—	2	3.1
0026	200	60	101	150	110	125	110	125	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	37.4	278	37.4	278	—	—	2	8.2
	230	60	94	100	110	125	110	125	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	34.6	278	34.6	278	—	—	2	7.8
	380	60	55	60	60	70	60	70	# 10 - # 1	# 14 - 1/0	# 14 - 2	19.9	151	19.9	151	—	—	2	4.8
	460	60	46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	16.5	127	16.5	127	—	—	2	4.0
	575	60	36	60	40	45	40	45	# 10 - # 1	# 14 - 1/0	# 14 - 2	13.2	100	13.2	100	—	—	2	3.1
0030	200	60	128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	49.4	350	49.4	350	—	—	2	8.2
	230	60	119	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	45.8	350	45.8	350	—	—	2	7.8
	380	60	69	100	80	90	80	90	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	26.4	195	26.4	195	—	—	2	4.8
	460	60	58	60	70	70	70	70	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	21.8	158	21.8	158	—	—	2	4.0
	575	60	46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	17.4	125	17.4	125	—	—	2	3.1
0036	200	60	138	150	175	175	175	175	# 10 - 3/0	# 2 - 4/0	# 3 - 300	53.8	425	53.8	425	—	—	2	8.2
	230	60	128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 3 - 300	49.8	425	49.8	425	—	—	2	7.8
	380	60	75	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	28.7	239	28.7	239	—	—-	2	4.8
	460	60	62	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	23.7	187	23.7	187	—	—	2	4.0
	575	60	49	60	60	60	60	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	19.0	148	19.0	148	—	—	2	3.1
0040	200	60	178	200	200	225	200	225	# 10 - 300	# 3 - 300	# 3 - 300	49.4	350	49.4	350	49.4	350	2	8.2
	230	60	165	200	200	200	200	200	# 10 - 300	# 3 - 300	# 3 - 300	45.8	350	45.8	350	45.8	350	2	7.8
	380	60	96	150	110	110	110	110	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	26.4	195	26.4	195	26.4	195	2	4.8
	460	60	79	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	21.8	158	21.8	158	21.8	158	2	4.0
	575	60	63	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	17.4	125	17.4	125	17.4	125	2	3.1

See Notes and Legend on page 40.

ELECTRICAL DATA – DUAL POINT POWER SUPPLY CONNECTIONS – YCUL0046E_ - YCUL0090E_

Two Field Provided Power Supply Circuits to the chiller. Field connections to Factory Provided Terminal Blocks per system, Non-Fused Disconnect Switch (optional) or Circuit Breaker (optional).

TABLE 8 – DUAL POINT POWER SUPPLY CONNECTIONS

MODEL YCUL	VOLT	HZ	SYSTEM #1 FIELD SUPPLIED WIRING									SYSTEM #1 COMPRESSOR & FAN							
			MCA[1]	MIN N/F DISC SW[2]	D.E. FUSE		CKT. BKR.[5]		INCOMING (LUGS) WIRE RANGE[6]			COMPR. #1		COMPR. #2		COMPR. #3		FANS	
					MIN[3]	MAX[4]	MIN	MAX	TERMINAL BLOCK (std)	NF DISC. SWITCH (opt)	CIRCUIT BREAKER (opt)	RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)
0046	200	60	101	150	110	125	110	125	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	33.2	278	33.2	278	—	—	2	8.2
	230	60	94	100	110	125	110	125	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	33.2	278	33.2	278	—	—	2	7.8
	380	60	55	60	60	70	60	70	# 10 - # 1	# 14 - 1/0	# 14 - 2	19.9	151	19.9	151	—	—	2	4.8
	460	60	46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	16.6	127	16.6	127	—	—	2	4.0
	575	60	36	60	40	45	40	45	# 10 - # 1	# 14 - 1/0	# 14 - 2	13.3	100	13.3	100	—	—	2	3.1
0050	200	60	128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	40.0	350	40.0	350	—	—	2	8.2
	230	60	119	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	40.0	350	40.0	350	—	—	2	7.8
	380	60	69	100	80	90	80	90	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	24.0	195	24.0	195	—	—	2	4.8
	460	60	58	60	70	70	70	70	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.9	167	19.9	167	—	—	2	4.0
	575	60	46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	16.0	125	16.0	125	—	—	2	3.1
0056	200	60	128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	40.0	350	40.0	350	—	—	2	8.2
	230	60	119	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	40.0	350	40.0	350	—	—	2	7.8
	380	60	69	100	80	90	80	90	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	24.0	195	24.0	195	—	—	2	4.8
	460	60	58	60	70	70	70	70	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.9	167	19.9	167	—	—	2	4.0
	575	60	46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	16.0	125	16.0	125	—	—	2	3.1
0060	200	60	138	150	175	175	175	175	# 10 - 3/0	# 2 - 4/0	# 3 - 300	47.8	425	47.8	425	—	—	2	8.2
	230	60	128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 3 - 300	47.8	425	47.8	425	—	—	2	7.8
	380	60	75	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	28.7	239	28.7	239	—	—	2	4.8
	460	60	62	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	23.9	198	23.9	198	—	—	2	4.0
	575	60	49	60	60	60	60	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	19.1	148	19.1	148	—	—	2	3.1
0066	200	60	138	150	175	175	175	175	# 10 - 3/0	# 2 - 4/0	# 3 - 300	47.8	425	47.8	425	—	—	2	8.2
	230	60	128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 3 - 300	47.8	425	47.8	425	—	—	2	7.8
	380	60	75	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	28.7	239	28.7	239	—	—	2	4.8
	460	60	62	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	23.9	198	23.9	198	—	—	2	4.0
	575	60	49	60	60	60	60	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	19.1	148	19.1	148	—-	—	2	3.1
0076	200	60	178	200	200	225	200	225	# 10 - 300	# 3 - 300	# 3 - 300	40.0	350	40.0	350	40.0	350	2	8.2
	230	60	165	200	200	200	200	200	# 10 - 300	# 3 - 300	# 3 - 300	40.0	350	40.0	350	40.0	350	2	7.8
	380	60	96	150	110	110	110	110	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	24.0	195	24.0	195	24.0	195	2	4.8
	460	60	79	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.9	167	19.9	167	19.9	167	2	4.0
	575	60	63	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	16.0	125	16.0	125	16.0	125	2	3.1
0080	200	60	178	200	200	225	200	225	# 10 - 300	# 3 - 300	# 3 - 300	40.0	350	40.0	350	40.0	350	2	8.2
	230	60	165	200	200	200	200	200	# 10 - 300	# 3 - 300	# 3 - 300	40.0	350	40.0	350	40.0	350	2	7.8
	380	60	96	150	110	110	110	110	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	24.0	195	24.0	195	24.0	195	2	4.8
	460	60	79	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.9	167	19.9	167	19.9	167	2	4.0
	575	60	63	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	16.0	125	16.0	125	16.0	125	2	3.1
0086	200	60	192	250	225	225	225	225	# 10 - 300	# 3 - 300	# 3 - 300	47.8	425	47.8	425	47.8	425	2	8.2
	230	60	178	200	200	225	200	225	# 10 - 300	# 3 - 300	# 3 - 300	47.8	425	47.8	425	47.8	425	2	7.8
	380	60	103	150	125	125	125	125	# 10 - # 1	# 2 - 4/0	# 2 - 4/0	28.7	239	28.7	239	28.7	239	2	4.8
	460	60	86	100	100	100	100	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	23.9	198	23.9	198	23.9	198	2	4.0
	575	60	68	100	80	80	80	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.1	148	19.1	148	19.1	148	2	3.1
0090	200	60	192	250	225	225	225	225	# 10 - 300	# 3 - 300	# 3 - 300	47.8	425	47.8	425	47.8	425	2	8.2
	230	60	178	200	200	225	200	225	# 10 - 300	# 3 - 300	# 3 - 300	47.8	425	47.8	425	47.8	425	2	7.8
	380	60	103	150	125	125	125	125	# 10 - # 1	# 2 - 4/0	# 2 - 4/0	28.7	239	28.7	239	28.7	239	2	4.8
	460	60	86	100	100	100	100	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	23.9	198	23.9	198	23.9	198	2	4.0
	575	60	68	100	80	80	80	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.1	148	19.1	148	19.1	148	2	3.1

NOTES: See Notes and Legend on Page 40, 150.63-NM5.

SYSTEM #2 FIELD SUPPLIED WIRING									SYSTEM #2 COMPRESSOR & FAN							
MCA[1]	MIN N/F DISC SW[2]	D.E. FUSE		CKT. BKR.[5]		INCOMING (LUGS) WIRE RANGE[6]			COMPR. #1		COMPR. #2		COMPR. #3		FANS	
		MIN[3]	MAX[4]	MIN	MAX	TERMINAL BLOCK (std)	NF DISC. SWITCH (opt)	CIRCUIT BREAKER (opt)	RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)
101	150	110	125	110	125	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	37.4	278	37.4	278	—	—	2	8.2
94	100	110	125	110	125	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	34.6	278	34.6	278	—	—	2	7.8
55	60	60	70	60	70	# 10 - # 1	# 14 - 1/0	# 14 - 2	19.9	151	19.9	151	—	—	2	4.8
46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	16.5	127	16.5	127	—	—	2	4.0
36	60	40	45	40	45	# 10 - # 1	# 14 - 1/0	# 14 - 2	13.2	100	13.2	100	—	—	2	3.1
101	150	110	125	110	125	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	37.4	278	37.4	278	—	—	2	8.2
94	100	110	125	110	125	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	34.6	278	34.6	278	—	—	2	7.8
55	60	60	70	60	70	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.9	151	19.9	151	—	—	2	4.8
46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	16.5	127	16.5	127	—	—	2	4.0
36	60	40	45	40	45	# 10 - # 1	# 14 - 1/0	# 14 - 2	13.2	100	13.2	100	—	—	2	3.1
128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	49.4	350	49.4	350	—	—	2	8.2
119	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	45.8	350	45.8	350	—	—	2	7.8
69	100	80	90	80	90	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	26.4	195	26.4	195	—	—	2	4.8
58	60	70	70	70	70	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	21.8	158	21.8	158	—	—	2	4.0
46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	17.4	125	17.4	125	—	—	2	3.1
128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	49.4	350	49.4	350	—	—	2	8.2
119	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	45.8	350	45.8	350	—	—	2	7.8
69	100	80	90	80	90	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	26.4	195	26.4	195	—	—	2	4.8
58	60	70	70	70	70	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	21.8	158	21.8	158	—	—	2	4.0
46	60	50	60	50	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	17.4	125	17.4	125	—	—	2	3.1
138	150	175	175	175	175	# 10 - 3/0	# 2 - 4/0	# 3 - 300	53.8	425	53.8	425	—	—	2	8.2
128	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 3 - 300	49.8	425	49.8	425	—	—	2	7.8
75	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	28.7	239	28.7	239	—	—	2	4.8
62	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	23.7	187	23.7	187	—	—	2	4.0
49	60	60	60	60	60	# 10 - # 1	# 14 - 1/0	# 14 - 2	19.0	148	19.0	148	—	—	2	3.1
138	150	150	175	150	175	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	37.4	278	37.4	278	37.4	278	2	8.2
129	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0	34.6	278	34.6	278	34.6	278	2	7.8
75	100	80	90	80	90	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.9	151	19.9	151	19.9	151	2	4.8
62	100	70	70	70	70	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	16.5	127	16.5	127	16.5	127	2	4.0
50	60	60	60	60	60	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	13.2	100	13.2	100	13.2	100	2	3.1
178	200	200	225	200	225	# 10 - 300	# 3 - 300	# 3 - 300	49.4	350	49.4	350	49.4	350	2	8.2
165	200	200	200	200	200	# 10 - 300	# 3 - 300	# 3 - 300	45.8	350	45.8	350	45.8	350	2	7.8
96	150	110	110	110	110	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	26.4	195	26.4	195	26.4	195	2	4.8
79	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	21.8	158	21.8	158	21.8	158	2	4.0
63	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	17.4	125	17.4	125	17.4	125	2	3.1
178	200	200	225	200	225	# 10 - 300	# 3 - 300	# 3 - 300	49.4	350	49.4	350	49.4	350	2	8.2
165	200	200	200	200	200	# 10 - 300	# 3 - 300	# 3 - 300	45.8	350	45.8	350	45.8	350	2	7.8
96	150	110	110	110	110	# 10 - # 1	# 14 - 1/0	# 2 - 4/0	26.4	195	26.4	195	26.4	195	2	4.8
79	100	90	100	90	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	21.8	158	21.8	158	21.8	158	2	4.0
63	100	70	80	70	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	17.4	125	17.4	125	17.4	125	2	3.1
192	250	225	225	225	225	# 10 - 300	# 3 - 300	# 3 - 300	53.8	425	53.8	425	53.8	425	2	8.2
178	200	200	225	200	225	# 10 - 300	# 3 - 300	# 3 - 300	49.8	425	49.8	425	49.8	425	2	7.8
103	150	125	125	125	125	# 10 - # 1	# 2 - 4/0	# 2 - 4/0	28.7	239	28.7	239	28.7	239	2	4.8
86	100	100	100	100	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	23.7	187	23.7	187	23.7	187	2	4.0
68	100	80	80	80	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0	19.0	148	19.0	148	19.0	148	2	3.1

ELECTRICAL DATA – MULTIPLE POINT POWER SUPPLY CONNECTIONS – YCUL0096E_ - YCUL0140E_

Two Field Provided Power Supply Circuits to the chiller. Field connections to Factory Provided Terminal Blocks (standard), Non-Fused Disconnect Switches (optional), or Individual System Circuit Breakers (optional) per electrical system

TABLE 9 – MULTIPLE POINT POWER SUPPLY CONNECTIONS

MODEL YCUL	VOLT	HZ	SYSTEM #1 FIELD SUPPLIED WIRING								
			MCA[1]	MIN N/F DISC SW[2]	D.E. FUSE		CKT. BKR.[5]		INCOMING (LUGS) WIRE RANGE[6]		
					MIN[3]	MAX[4]	MIN	MAX	TERMINAL BLOCK (std)	NF DISC. SWITCHES (opt)	CIR BREAKERS (opt)
0096	200	60	221	250	250	300	250	300	# 10 - 300	(1) # 6 - 350	(1) # 6 - 350
	230	60	206	250	250	250	250	250	# 10 - 300	(1) # 4 - 300	(1) # 6 - 350
	380	60	120	150	150	150	150	150	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	460	60	99	150	110	125	110	125	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
	575	60	79	100	90	100	90	100	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0100	200	60	221	250	250	300	250	300	# 10 - 300	(1) # 6 - 350	(1) # 6 - 350
	230	60	206	250	250	250	250	250	# 10 - 300	(1) # 4 - 300	(1) # 6 - 350
	380	60	120	150	150	150	150	150	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	460	60	99	150	110	125	110	125	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
	575	60	79	100	90	100	90	100	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0106	200	60	251	400	300	300	300	300	# 4 - 500	250 - 500	250 - 500
	230	60	233	250	250	250	250	250	# 4 - 500	250 - 500	250 - 500
	380	60	135	150	150	150	150	150	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	460	60	112	150	125	125	125	125	# 10 - 3/0	(1) # 6 - 350	# 3 - 3/0
	575	60	89	100	100	110	100	110	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0120	200	60	251	400	300	300	300	300	# 4 - 500	250 - 500	250 - 500
	230	60	233	250	250	250	250	250	# 4 - 500	250 - 500	250 - 500
	380	60	135	150	150	150	150	150	# 14 - 2/0	(1) # 6 - 350	# 6 - 350
	460	60	112	150	125	125	125	125	# 14 - 2/0	(1) # 6 - 350	# 3 - 3/0
	575	60	89	100	100	110	100	110	# 14 - 2/0	(1) # 6 - 350	# 3 - 3/0
0130	200	60	317	400	350	400	350	400	# 4 - 500	250 - 500	250 - 500
	230	60	294	400	350	350	350	350	# 4 - 500	250 - 500	250 - 500
	380	60	171	200	200	200	200	200	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	460	60	141	200	175	175	175	175	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	575	60	113	150	125	125	125	125	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0140	200	60	317	400	350	400	350	400	# 4 - 500	250 - 500	250 - 500
	230	60	294	400	350	350	350	350	# 4 - 500	250 - 500	250 - 500
	380	60	171	200	200	200	200	200	# 10 - 3/0	# 6 - 350	# 6 - 350
	460	60	141	200	175	175	175	175	# 10 - 3/0	# 6 - 350	# 6 - 350
	575	60	113	150	125	125	125	125	# 12 - # 1	# 6 - 350	# 3 - 3/0

MODEL YCUL	VOLT	HZ	SYSTEM #2 FIELD SUPPLIED WIRING								
			MCA[1]	MIN N/F DISC SW[2]	D.E. FUSE		CKT. BKR.[5]		INCOMING (LUGS) WIRE RANGE[6]		
					MIN[3]	MAX[4]	MIN	MAX	TERMINAL BLOCK (std)	NF DISC. SWITCHES (opt)	CIR BREAKERS (opt)
0096	200	60	181	200	225	250	225	250	# 10 - 300	(1) # 4 - 300	(1) # 4 - 300
	230	60	168	200	200	225	200	225	# 10 - 300	(1) # 4 - 300	(1) # 4 - 300
	380	60	98	150	125	125	125	125	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
	460	60	81	100	90	110	100	110	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
	575	60	65	100	80	90	80	90	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0100	200	60	221	250	250	300	250	300	# 10 - 300	(1) # 6 - 350	# 6 - 350
	230	60	206	250	250	250	250	250	# 10 - 300	(1) # 4 - 300	# 6 - 350
	380	60	120	150	150	150	150	150	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	460	60	99	150	110	125	110	125	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
	575	60	79	100	90	100	90	100	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0106	200	60	221	250	250	300	250	300	# 10 - 300	(1) # 6 - 350	# 6 - 350
	230	60	206	250	250	250	250	250	# 10 - 300	(1) # 4 - 300	# 6 - 350
	380	60	120	150	150	150	150	150	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	460	60	99	150	110	125	110	125	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
	575	60	79	100	90	100	90	100	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0120	200	60	251	400	300	300	300	300	# 4 - 500	250 - 500	250 - 500
	230	60	233	250	250	250	250	250	# 4 - 500	250 - 500	250 - 500
	380	60	135	150	150	150	150	150	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	460	60	112	150	125	125	125	125	# 10 - 3/0	(1) # 6 - 350	# 3 - 3/0
	575	60	89	100	100	110	100	110	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0130	200	60	259	400	300	300	300	300	# 4 - 500	250 - 500	250 - 500
	230	60	241	400	300	300	300	300	# 4 - 500	250 - 500	250 - 500
	380	60	140	150	150	175	150	175	# 10 - 3/0	(1) # 6 - 350	# 6 - 350
	460	60	116	150	125	125	125	125	# 10 - 3/0	(1) # 6 - 350	# 3 - 3/0
	575	60	92	100	100	110	100	110	# 12 - # 1	(1) # 6 - 350	# 3 - 3/0
0140	200	60	317	400	350	400	350	400	# 4 - 500	250 - 500	250 - 500
	230	60	294	400	350	350	350	350	# 4 - 500	250 - 500	250 - 500
	380	60	171	200	200	200	200	200	# 10 - 3/0	# 6 - 350	# 6 - 350
	460	60	141	200	175	175	175	175	# 10 - 3/0	# 6 - 350	# 3 - 3/0
	575	60	113	150	125	125	125	125	# 12 - # 1	# 6 - 350	# 3 - 3/0

NOTES: See Notes and Legend on Page 40, 150.63-NM5.

SYSTEM #1 COMPRESSOR & FAN							
COMPR. #1		COMPR. #2		COMPR. #3		FANS	
RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)
87.2	500	87.2	500	—	—	3	8.2
80.8	500	80.8	500	—	—	3	7.8
46.6	305	46.6	305	—	—	3	4.8
38.5	250	38.5	250	—	—	3	4.0
30.8	198	30.8	198	—	—	3	3.1
87.2	500	87.2	500	—	—	3	8.2
80.8	500	80.8	500	—	—	3	7.8
46.6	305	46.6	305	—	—	3	4.8
38.5	250	38.5	250	—	—	3	4.0
30.8	198	30.8	198	—	—	3	3.1
69.4	505	69.4	505	69.4	505	4	8.2
64.3	505	64.3	505	64.3	505	4	7.8
37.0	280	37.0	280	37.0	280	4	4.8
30.6	225	30.6	225	30.6	225	4	4.0
24.5	180	24.5	180	24.5	180	4	3.1
69.4	505	69.4	505	69.4	505	4	8.2
64.3	505	64.3	505	64.3	505	4	7.8
37.0	280	37.0	280	37.0	280	4	4.8
30.6	225	30.6	225	30.6	225	4	4.0
24.5	180	24.5	180	24.5	180	4	3.1
87.2	500	87.2	500	87.2	500	4	8.2
80.8	500	80.8	500	80.8	500	4	7.8
46.6	305	46.6	305	46.6	305	4	4.8
38.5	250	38.5	250	38.5	250	4	4.0
30.8	198	30.8	198	30.8	198	4	3.1
87.2	500	87.2	500	87.2	500	4	8.2
80.8	500	80.8	500	80.8	500	4	7.8
46.6	305	46.6	305	46.6	305	4	4.8
38.5	250	38.5	250	38.5	250	4	4.0
30.8	198	30.8	198	30.8	198	4	3.1

SYSTEM #2 COMPRESSOR & FAN							
COMPR. #1		COMPR. #2		COMPR. #3		FANS	
RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)
69.4	505	69.4	505	—	—	3	8.2
64.3	505	64.3	505	—	—	3	7.8
37.0	280	37.0	280	—	—	3	4.8
30.6	225	30.6	225	—	—	3	4.0
24.5	180	24.5	180	—	—	3	3.1
87.2	500	87.2	500	—	—	3	8.2
80.8	500	80.8	500	—	—	3	7.8
46.6	305	46.6	305	—	—	3	4.8
38.5	250	38.5	250	—	—	3	4.0
30.8	198	30.8	198	—	—	3	3.1
87.2	500	87.2	500	—	—	4	8.2
80.8	500	80.8	500	—	—	4	7.8
46.6	305	46.6	305	—	—	4	4.8
38.5	250	38.5	250	—	—	4	4.0
30.8	198	30.8	198	—	—	4	3.1
69.4	505	69.4	505	69.4	505	4	8.2
64.3	505	64.3	505	64.3	505	4	7.8
37.0	280	37.0	280	37.0	280	4	4.8
30.6	225	30.6	225	30.6	225	4	4.0
24.5	180	24.5	180	24.5	180	4	3.1
69.4	505	69.4	505	69.4	505	4	8.2
64.3	505	64.3	505	64.3	505	4	7.8
37.0	280	37.0	280	37.0	280	4	4.8
30.6	225	30.6	225	30.6	225	4	4.0
24.5	180	24.5	180	24.5	180	4	3.1
87.2	500	87.2	500	87.2	500	4	8.2
80.8	500	80.8	500	80.8	500	4	7.8
46.6	305	46.6	305	46.6	305	4	4.8
38.5	250	38.5	250	38.5	250	4	4.0
30.8	198	30.8	198	30.8	198	4	3.1

ELECTRICAL DATA – SINGLE POINT POWER SUPPLY CONNECTIONS – YCUL0046E_ - YCUL0090E_

(One Field Provided Power Supply Circuit to the chiller. Field connections to Factory Provided Terminal Block (optional), Non-Fused Disconnect Switch (optional) or Circuit Breaker (optional).)

TABLE 10 – SINGLE POINT POWER SUPPLY CONNECTIONS

MODEL YCUL	VOLT	HZ	SINGLE POINT FIELD SUPPLIED WIRING								
			MCA[1]	MIN N/F DISC SW[2]	D.E. FUSE		CKT. BKR.[5]		INCOMING (LUGS) WIRE RANGE[6]		
					MIN[3]	MAX[4]	MIN	MAX	TERMINAL BLOCK (opt)	NF DISC. SWITCH (opt)	CIRCUIT BREAKER (opt)
0046	200	60	192	250	225	225	225	225	# 10 - 300	# 6 - 350	# 3 - 300
	230	60	179	200	200	200	200	200	# 10 - 300	# 6 - 350	# 3 - 300
	380	60	104	150	110	110	110	110	# 10 - # 1	# 2 - 4/0	# 2 - 4/0
	460	60	87	100	100	100	100	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0
	575	60	69	100	80	80	80	80	# 10 - # 1	# 14 - 1/0	# 14 - 1/0
0050	200	60	219	250	250	250	250	250	# 10 - 300	# 6 - 350	# 3 - 300
	230	60	204	250	225	225	225	225	# 10 - 300	# 6 - 350	# 3 - 300
	380	60	119	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0
	460	60	98	150	110	110	110	110	# 10 - # 1	# 2 - 4/0	# 14 - 1/0
	575	60	78	100	90	90	90	90	# 10 - # 1	# 14 - 1/0	# 14 - 1/0
0056	200	60	243	400	300	300	300	300	# 10 - 300	250-500	# 6 - 350
	230	60	226	250	250	250	250	250	# 10 - 300	# 6 - 350	# 6 - 350
	380	60	132	150	150	250	150	250	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0
	460	60	109	150	125	125	125	125	# 10 - # 1	# 2 - 4/0	# 2 - 4/0
	575	60	87	100	100	100	100	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0
0060	200	60	253	400	300	300	300	300	# 10 - 300	250-500	250-500
	230	60	235	400	250	250	250	250	# 10 - 300	250-500	# 6 - 350
	380	60	137	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0
	460	60	113	150	125	125	125	125	# 10 - # 1	# 2 - 4/0	# 2 - 4/0
	575	60	90	100	100	100	100	100	# 10 - # 1	# 14 - 1/0	# 14 - 1/0
0066	200	60	262	400	300	300	300	300	# 4 - 500	250-500	250-500
	230	60	243	400	300	300	300	300	# 4 - 500	250-500	250-500
	380	60	142	200	150	150	150	150	# 10 - 3/0	# 6 - 350	# 2 - 4/0
	460	60	117	150	125	125	125	125	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0
	575	60	94	150	100	110	100	110	# 10 - # 1	# 2 - 4/0	# 14 - 1/0
0076	200	60	306	400	350	350	350	350	# 4 - 500	250-500	250-500
	230	60	264	400	300	300	300	300	# 4 - 500	250-500	250-500
	380	60	165	200	175	175	175	175	# 10 - 3/0	# 6 - 350	# 2 - 4/0
	460	60	137	200	150	150	150	150	# 10 - 3/0	# 6 - 350	# 2 - 4/0
	575	60	109	150	125	125	125	125	# 10 - # 1	# 2 - 4/0	# 2 - 4/0
0080	200	60	342	400	400	400	400	400	(2) # 10 - 3/0	250-500	250-500
	230	60	318	400	350	350	350	350	# 4 - 500	250-500	250-500
	380	60	185	250	200	200	200	200	# 10 - 300	# 6 - 350	# 4 - 300
	460	60	153	200	175	175	175	175	# 10 - 3/0	# 6 - 350	# 4 - 300
	575	60	122	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0
0086	200	60	356	400	400	400	400	400	(2) # 10 - 300	250-500	250-500
	230	60	331	400	350	350	350	350	# 4 - 500	250-500	250-500
	380	60	192	250	200	200	200	200	# 10 - 300	# 6 - 350	# 4 - 300
	460	60	159	200	175	175	175	175	# 10 - 3/0	# 6 - 350	# 4 - 300
	575	60	127	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0
0090	200	60	369	600	400	400	400	400	(2) # 10 - 300	(3) 2/0 - 400	250-500
	230	60	343	400	400	400	400	400	(2) # 10 - 300	250-500	250-500
	380	60	199	250	225	225	225	225	# 10 - 300	# 6 - 350	# 4 - 300
	460	60	165	200	175	175	175	175	# 10 - 3/0	# 6 - 350	# 4 - 300
	575	60	131	150	150	150	150	150	# 10 - 3/0	# 2 - 4/0	# 2 - 4/0

NOTES: See Notes and Legend on Page 40, 150.63-NM5.

SYSTEM #1 COMPRESSOR & FAN								SYSTEM #2 FIELD SUPPLIED WIRING							
COMPR. #1		COMPR. #2		COMPR. #3		FANS		COMPR. #1		COMPR. #2		COMPR. #3		FANS	
RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)	RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)
37.4	278	37.4	278	—	—	2	8.2	37.4	278	37.4	278	—	—	2	8.2
34.6	278	34.6	278	—	—	2	7.8	34.6	278	34.6	278	—	—	2	7.8
19.9	151	19.9	151	—	—	2	4.8	19.9	151	19.9	151	—	—	2	4.8
16.5	127	16.5	127	—	—	2	4.0	16.5	127	16.5	127	—	—	2	4.0
13.2	100	13.2	100	—	—	2	3.1	13.2	100	13.2	100	—	—	2	3.1
49.4	350	49.4	350	—	—	2	8.2	37.4	278	37.4	278	—	—	2	8.2
45.8	350	45.8	350	—	—	2	7.8	34.6	278	34.6	278	—	—	2	7.8
26.4	195	26.4	195	—	—	2	4.8	19.9	151	19.9	151	—	—	2	4.8
21.8	158	21.8	158	—	—	2	4.0	16.5	127	16.5	127	—	—	2	4.0
17.4	125	17.4	125	—	—	2	3.1	13.2	100	13.2	100	—	—	2	3.1
49.4	350	49.4	350	—	—	2	8.2	49.4	350	49.4	350	—	—	2	8.2
45.8	350	45.8	350	—	—	2	7.8	45.8	350	45.8	350	—	—	2	7.8
26.4	195	26.4	195	—	—	2	4.8	26.4	195	26.4	195	—	—	2	4.8
21.8	158	21.8	158	—	—	2	4.0	21.8	158	21.8	158	—	—	2	4.0
17.4	125	17.4	125	—	—	2	3.1	17.4	125	17.4	125	—	—	2	3.1
53.8	425	53.8	425	—	—	2	8.2	49.4	350	49.4	350	—	—	2	8.2
49.8	425	49.8	425	—	—	2	7.8	45.8	350	45.8	350	—	—	2	7.8
28.7	239	28.7	239	—	—	2	4.8	26.4	195	26.4	195	—	—	2	4.8
23.7	187	23.7	187	—	—	2	4.0	21.8	158	21.8	158	—	—	2	4.0
19.0	148	19.0	148	—	—	2	3.1	17.4	125	17.4	125	—	—	2	3.1
53.8	425	53.8	425	—	—	2	8.2	53.8	425	53.8	425	—	—	2	8.2
49.8	425	49.8	425	—	—	2	7.8	49.8	425	49.8	425	—	—	2	7.8
28.7	239	28.7	239	—	—	2	4.8	28.7	239	28.7	239	—	—	2	4.8
23.7	187	23.7	187	—	—	2	4.0	23.7	187	23.7	187	—	—	2	4.0
19.0	148	19.0	148	—	—	2	3.1	19.0	148	19.0	148	—	—	2	3.1
49.4	350	49.4	350	49.4	350	2	8.2	37.4	278	37.4	278	37.4	278	2	8.2
45.8	350	45.8	350	45.8	350	2	7.8	34.6	278	34.6	278	34.6	278	2	7.8
26.4	195	26.4	195	26.4	195	2	4.8	19.9	151	19.9	151	19.9	151	2	4.8
21.8	158	21.8	158	21.8	158	2	4.0	16.5	127	16.5	127	16.5	127	2	4.0
17.4	125	17.4	125	17.4	125	2	3.1	13.2	100	13.2	100	13.2	100	2	3.1
49.4	350	49.4	350	49.4	350	2	8.2	49.4	350	49.4	350	49.4	350	2	8.2
45.8	350	45.8	350	45.8	350	2	7.8	45.8	350	45.8	350	45.8	350	2	7.8
26.4	195	26.4	195	26.4	195	2	4.8	26.4	195	26.4	195	26.4	195	2	4.8
21.8	158	21.8	158	21.8	158	2	4.0	21.8	158	21.8	158	21.8	158	2	4.0
17.4	125	17.4	125	17.4	125	2	3.1	17.4	125	17.4	125	17.4	125	2	3.1
53.8	425	53.8	425	53.8	425	2	8.2	49.4	350	49.4	350	49.4	350	2	8.2
49.8	425	49.8	425	49.8	425	2	7.8	45.8	350	45.8	350	45.8	350	2	7.8
28.7	239	28.7	239	28.7	239	2	4.8	26.4	195	26.4	195	26.4	195	2	4.8
23.7	187	23.7	187	23.7	187	2	4.0	21.8	158	21.8	158	21.8	158	2	4.0
19.0	148	19.0	148	19.0	148	2	3.1	17.4	125	17.4	125	17.4	125	2	3.1
53.8	425	53.8	425	53.8	425	2	8.2	53.8	425	53.8	425	53.8	425	2	8.2
49.8	425	49.8	425	49.8	425	2	7.8	49.8	425	49.8	425	49.8	425	2	7.8
28.7	239	28.7	239	28.7	239	2	4.8	28.7	239	28.7	239	28.7	239	2	4.8
23.7	187	23.7	187	23.7	187	2	4.0	23.7	187	23.7	187	23.7	187	2	4.0
19.0	148	19.0	148	19.0	148	2	3.1	19.0	148	19.0	148	19.0	148	2	3.1

ELECTRICAL DATA – SINGLE POINT POWER SUPPLY CONNECTIONS WITH INDIVIDUAL SYSTEM CIRCUIT BREAKERS – YCUL0096E_ - YCUL0140E_

One Field Provided Power Supply Circuit to the chiller. Field connections to Factory Provided Terminal Block (optional) or Non-Fused Disconnect Switch (optional). Includes Individual Branch Circuit Protection (Breakers) per electrical system

TABLE 11 – SINGLE POINT POWER SUPPLY CONNECTIONS WITH INDIVIDUAL SYSTEM CIRCUIT BREAKERS

MODEL YCUL	VOLT	HZ	SINGLE POINT FIELD SUPPLIED WIRING							
			MCA[1]	MIN N/F DISC SW[2]	D.E. FUSE		CKT. BKR.[5]		INCOMING (LUGS) WIRE RANGE[6]	
					MIN[3]	MAX[4]	MIN	MAX	TERMINAL BLOCK (opt)	NF DISC. SWITCH (opt)
0096	200	60	385	600	450	450	450	450	(2) # 6 - 500	(3) 2/0 - 400
	230	60	358	400	400	400	400	400	(2) # 6 - 500	(3) 2/0 - 400
	380	60	208	250	225	250	225	250	# 10 - 300	(1) # 6 - 350
	460	60	172	200	200	200	200	200	# 10 - 3/0	(1) # 6 - 350
	575	60	137	150	150	150	150	150	# 10 - 3/0	(1) # 6 - 350
0100	200	60	420	600	450	500	450	500	(2) # 6 - 500	(2) 250 - 500
	230	60	391	600	450	450	450	450	(2) # 6 - 500	(2) 250 - 500
	380	60	227	250	250	250	250	250	# 10 - 300	(1 or 2) 3/0 - 500
	460	60	188	250	200	225	200	225	# 10 - 300	(1) # 6 - 350
	575	60	150	200	175	175	175	175	# 10 - 3/0	(1) # 6 - 350
0106	200	60	454	600	500	500	500	500	(2) # 6 - 500	(2) 250 - 500
	230	60	422	600	450	450	450	450	(2) # 6 - 500	(2) 250 - 500
	380	60	245	400	300	300	300	300	# 4 - 500	(1 or 2) 3/0 - 500
	460	60	203	250	225	225	225	225	# 10 - 300	(1) # 6 - 350
	575	60	162	200	175	175	175	175	# 10 - 3/0	(1) # 6 - 350
0120	200	60	483	600	600	600	600	600	(2) # 6 - 500	(2) 250 - 500
	230	60	449	600	500	500	500	500	(2) # 6 - 500	(2) 250 - 500
	380	60	261	400	300	300	300	300	# 4 - 500	(1 or 2) 3/0 - 500
	460	60	216	250	225	225	225	225	# 10 - 300	(1 or 2) 3/0 - 500
	575	60	172	200	200	200	200	200	# 10 - 300	(1) # 6 - 350
0130	200	60	553	800	600	600	600	600	(2) # 6 - 500	(2) 250 - 500
	230	60	514	600	600	600	600	600	(2) # 6 - 500	(2) 250 - 500
	380	60	299	400	350	350	350	350	# 4 - 500	(1 or 2) 3/0 - 500
	460	60	247	400	300	300	300	300	# 10 - 300	(1 or 2) 3/0 - 500
	575	60	197	250	225	225	225	225	# 10 - 300	(1) # 6 - 350
0140	200	60	611	800	700	700	700	700	(2) # 6 - 500	(2) 250 - 500
	230	60	568	800	600	600	600	600	(2) # 6 - 500	(2) 250 - 500
	380	60	330	400	350	350	350	350	# 4 - 500	(1 or 2) 3/0 - 500
	460	60	271	400	300	300	300	300	# 10 - 300	(1 or 2) 3/0 - 500
	575	60	218	250	225	225	225	225	# 10 - 300	(1) 6AWG - 3s50

NOTES: See Notes and Legend on Page 40, 150.63-NM5.

SYSTEM #1 COMPRESSOR & FAN								SYSTEM #2 FIELD SUPPLIED WIRING							
COMPR. #1		COMPR. #2		COMPR. #3		FANS		COMPR. #1		COMPR. #2		COMPR. #3		FANS	
RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)	RLA	LRA	RLA	LRA	RLA	LRA	QTY	FLA(EA)
87.2	500	87.2	500	—	—	3	8.2	69.4	505	69.4	505	—	—	3	8.2
80.8	500	80.8	500	—	—	3	7.8	64.3	505	64.3	505	—	—	3	7.8
46.6	305	46.6	305	—	—	3	4.8	37.0	280	37.0	280	—	—	3	4.8
38.5	250	38.5	250	—	—	3	4.0	30.6	225	30.6	225	—	—	3	4.0
30.8	198	30.8	198	—	—	3	3.1	24.5	180	24.5	180	—	—	3	3.1
87.2	500	87.2	500	—	—	3	8.2	87.2	500	87.2	500	—	—	3	8.2
80.8	500	80.8	500	—	—	3	7.8	80.8	500	80.8	500	—	—	3	7.8
46.6	305	46.6	305	—	—	3	4.8	46.6	305	46.6	305	—	—	3	4.8
38.5	250	38.5	250	—	—	3	4.0	38.5	250	38.5	250	—	—	3	4.0
30.8	198	30.8	198	—	—	3	3.1	30.8	198	30.8	198	—	—	3	3.1
69.4	505	69.4	505	69.4	505	4	8.2	87.2	500	87.2	500	—	—	4	8.2
64.3	505	64.3	505	64.3	505	4	7.8	80.8	500	80.8	500	—	—	4	7.8
37.0	280	37.0	280	37.0	280	4	4.8	46.6	305	46.6	305	—	—	4	4.8
30.6	225	30.6	225	30.6	225	4	4.0	38.5	250	38.5	250	—	—	4	4.0
24.5	180	24.5	180	24.5	180	4	3.1	30.8	198	30.8	198	—	—	4	3.1
69.4	505	69.4	505	69.4	505	4	8.2	69.4	505	69.4	505	69.4	505	4	8.2
64.3	505	64.3	505	64.3	505	4	7.8	64.3	505	64.3	505	64.3	505	4	7.8
37.0	280	37.0	280	37.0	280	4	4.8	37.0	280	37.0	280	37.0	280	4	4.8
30.6	225	30.6	225	30.6	225	4	4.0	30.6	225	30.6	225	30.6	225	4	4.0
24.5	180	24.5	180	24.5	180	4	3.1	24.5	180	24.5	180	24.5	180	4	3.1
87.2	500	87.2	500	87.2	500	4	8.2	69.4	505	69.4	505	69.4	505	4	8.2
80.8	500	80.8	500	80.8	500	4	7.8	64.3	505	64.3	505	64.3	505	4	7.8
46.6	305	46.6	305	46.6	305	4	4.8	37.0	280	37.0	280	37.0	280	4	4.8
38.5	250	38.5	250	38.5	250	4	4.0	30.6	225	30.6	225	30.6	225	4	4.0
30.8	198	30.8	198	30.8	198	4	3.1	24.5	180	24.5	180	24.5	180	4	3.1
87.2	500	87.2	500	87.2	500	4	8.2	87.2	500	87.2	500	87.2	500	4	8.2
80.8	500	80.8	500	80.8	500	4	7.8	80.8	500	80.8	500	80.8	500	4	7.8
46.6	305	46.6	305	46.6	305	4	4.8	46.6	305	46.6	305	46.6	305	4	4.8
38.5	250	38.5	250	38.5	250	4	4.0	38.5	250	38.5	250	38.5	250	4	4.0
30.8	198	30.8	198	30.8	198	4	3.1	30.8	198	30.8	198	30.8	198	4	3.1

ELECTRICAL NOTES

NOTES:

1. Minimum Circuit Ampacity (MCA) is based on 125% of the rated load amps for the largest motor plus 100% of the rated load amps for all other loads included in the circuit, per N.E.C. Article 430-24. If the Factory Mounted Control Transformer is provided, add the following to the system MCA values in the electrical tables: -17, add 2.5 amps; -28, add 2.3 amps; -40, add 1.5 amps, -46, add 1.3 amps; -58, add 1 amps.
2. The minimum recommended disconnect switch is based on 115% of the rated load amps for all loads included in the circuit, per N.E.C. Article 440.
3. Minimum fuse size is based upon 150% of the rated load amps for the largest motor plus 100% of the rated load amps for all other loads included in the circuit to avoid nuisance trips at start-up due to lock rotor amps. It is not recommended in applications where brown outs, frequent starting and stopping of the unit, and/or operation at ambient temperatures in excess of 95°F is anticipated.
4. Maximum fuse size is based upon 225% of the rated load amps for the largest motor plus 100% of the rated load amps for all other loads included in the circuit, per N.E.C. Article 440-22.
5. Circuit breakers must be U.L. listed and CSA certified and maximum size is based on 225% of the rated load amps for the largest motor plus 100% of the rated load amps for all other loads included in the circuit. Exception: YCUL0016 and YCUL0026 must have the optional factory overloads installed to use a standard circuit breaker. Otherwise, an HACR-type circuit breakers must be used. Maximum HACR circuit breaker rating is based on 225% of the rated load amps for the largest motor plus 100% of the rated load amps for all other loads included in the circuit.
6. The “INCOMING WIRE RANGE” is the minimum and maximum wire size that can be accommodated by the unit wiring lugs. The (2) preceding the wire range indicates the number of termination points available per phase of the wire range specified. Actual wire size and number of wires per phase must be determined based on the National Electrical Code, using copper connectors only. Field wiring must also comply with local codes.
7. A ground lug is provided for each compressor system to accommodate a field grounding conductor per N.E.C. Table 250-95. A control circuit grounding lug is also supplied.
8. The supplied disconnect is a “Disconnecting Means” as defined in the N.E.C. 100, and is intended for isolating the unit for the available power supply to perform maintenance and troubleshooting. This disconnect is not intended to be a Load Break Device.
9. Field Wiring by others which complies to the National Electrical Code and Local Codes.

LEGEND

ACR-LINE	ACROSS THE LINE START
C.B.	CIRCUIT BREAKER
D.E.	DUAL ELEMENT FUSE
DISC SW	DISCONNECT SWITCH
FACT MOUNT CB	FACTORY MOUNTED CIRCUIT BREAKER
FLA	FULL LOAD AMPS
HZ	HERTZ
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MIN	MINIMUM
MIN NF	MINIMUM NON FUSED
RLA	RATED LOAD AMPS
S.P. WIRE	SINGLE POINT WIRING
UNIT MTD SERV SW	UNIT MOUNTED SERVICE (NON-FUSED DISCONNECT SWITCH)
LRA	LOCKED ROTOR AMPS

VOLTAGE CODE

-17 = 200-3-60
-28 = 230-3-60
-40 = 380-3-60
-46 = 460-3-60
-58 = 575-3-60

ELECTRICAL DATA

TABLE 12 – MICROPANEL POWER SUPPLY

UNIT VOLTAGE	UNIT VOLTAGE	CONTROL POWER	MCA	OVER CURRENT PROTECTION, SEE NOTE B		NF DISC Sw
			NOTE A	MIN	MAX	
MODELS w/o CONTROL TRANS		115-1-60/50	15A	10A	15A	30 A / 240V
MODELS w/ CONTROL TRANS	-17	200-1-60	15A	10A	15A	30 A / 240V
	-28	230-1-60	15A	10A	15A	30 A / 240V
	-40	380-1-60	15A	10A	15A	30 A / 480V
	-46	460-1-60	15A	10A	15A	30 A / 480V
	-58	575-1-60	15A	10A	15A	30 A / 600V

A. Minimum #14 AWG, 75°C, Copper Recommended

B. Minimum and Maximum Over Current Protection, Dual Element Fuse or Circuit Breaker

LEGEND: _____ Factory Supplied
__ __ __ __ Supplied by Others

It is possible that multiple sources of power can be supplying the unit power panel. To prevent serious injury or death, the technician should verify that NO LETHAL VOLTAGES are present inside the panel AFTER disconnecting power, PRIOR to working on equipment.

VOLTAGE LIMITATIONS

The following voltage limitations are absolute and operation beyond these limitations may cause serious damage to the compressor.

TABLE 13 – VOLTAGES

UNIT POWER	MIN.	MAX.
200-3-60	180	220
230-3-60	207	253
380-3-60	355	415
460-3-60	414	506
575-3-60	517	633

PHYSICAL DATA (ENGLISH)
YCUL0016E_ - YCUL0140E_

TABLE 14 – PHYSICAL DATA (ENGLISH)

	Model Number YCUL							
	0016	**0026**	**0030**	**0036**	**0040**	**0046**	**0050**	**0056**
General Unit Data								
Nominal Tons, R-22	15.2	20.8	25.9	31.2	34.0	42.3	46.9	51.7
Nominal Tons, R-407C	14.5	20.1	25.1	30.7	36.6	40.9	45.5	50.2
Number of Refrigerant Circuits	1	1	1	1	1	2	2	2
Refrigerant Charge, Operating								
R-22, ckt1 / ckt2, lbs	25.0	29.6	45.2	50.7	53.8	35.1/35.1	42.1/35.1	42.1/42.1
R-407C, ckt1 / ckt2, lbs	24.1	28.5	43.6	48.9	51.9	33.8/33.8	40.6/33.8	40.6/40.6
Pumpdown Capacity[1]								
R-22, ckt1 / ckt2, lbs	43.2	43.2	60.5	90.7	58.4/58.4	58.4/58.4	58.4/58.4	58.4/58.4
R-407C, ckt1 / ckt2, lbs	41.6	41.6	58.3	87.4	56.5/56.5	56.5/56.5	56.5/56.5	56.5/56.5
Oil Charge, ckt1 / ckt2, gallons	2.2	2.2	2.2	2.2	3.3	2.2/2.2	2.2/2.2	2.2/2.2
Operating / Shipping Weight								
Aluminum Fin Coils, lbs	2051	2058	2401	2445	2788	3947	4000	4057
Copper Fin Coils, lbs	2201	2208	2551	2595	2938	4247	4300	4357
Compressors, scroll type								
Compressors per circuit	2	2	2	2	3	2	2	2
Compressors per unit	2	2	2	2	3	4	4	4
Nominal Tons per compressor	7.5	10	13	15	13	10/10	13/10	13/13
Condenser								
Total Face Area ft2	47.2	47.2	66.1	66.1	66.1	128.0	128.0	128.0
Number of Rows	2	2	2	3	3	2	2	2
Fins per Inch	13	13	13	13	13	13	13	13
Condenser Fans								
Number of Fans total	2	2	2	2	2	4	4	4
Fan hp/kw	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4
Fan RPM	1140	1140	1140	1140	1140	1140	1140	1140
Number of Blades	3	3	3	3	3	3	3	3
Total Chiller CFM	16257	16257	23500	23500	23500	47360	47360	47360

NOTES: 1 Pump Down Capacity is based on 100°F (37.8°C) liquid R22 and 80% of condenser volume.
2 Operating Refrigerant Charge is for condensing units only, does not include refrigerant lines and evaporator coil.

PHYSICAL DATA (ENGLISH)
YCUL0016E_ - YCUL0140E_

Model Number YCUL											
0060	**0066**	**0076**	**0080**	**0086**	**0090**	**0096**	**0100**	**0106**	**0120**	**0130**	**0140**
56.2	62.2	68.9	77.0	83.6	90.1	90.8	98.4	108.9	122.1	133.6	144.4
54.9	61.3	66.5	74.9	81.8	88.5	87.2	94.2	104.2	117.6	128	137.9
2	2	2	2	2	2	2	2	2	2	2	2
46.8/42.1	56.2/56.2	58.5/48.4	64.7/64.7	71.8/64.7	78.0/78.0	86.3/73.2	86.3/86.3	104.3/86.3	106.9/106.9	106.9/106.9	106.9/106.9
45.1/40.6	54.2/54.2	56.4/46.7	62.4/62.4	69.2/62.4	75.2/75.2	83.2/70.5	83.2/83.2	100.5/83.2	103.0/103.0	103.0/103.0	103.0/103.0
58.4/58.4	87.6/87.6	68.1/68.1	102.2/102.2	102.2/102.2	102.2/102.2	150.0/150.0	150.0/150.0	170.2/170.2	194.8/194.8	194.8/194.8	194.8/194.8
56.5/56.5	84.4/84.4	65.6/65.6	98.5/98.5	98.5/98.5	98.5/98.5	145.8/145.8	145.8/145.8	165.5/165.5	189.4/189.4	189.4/189.4	189.4/189.4
2.2/2.2	2.2/2.2	3.3/3.3	3.3/3.3	3.3/3.3	3.3/3.3	4.2/4.2	4.2/4.2	6.3/4.2	6.3/6.3	6.3/6.3	6.3/6.3
4114	4175	4842	5004	5150	5240	5532	5646	6362	7720	8008	8396
4414	4475	5142	5384	5530	5620	6394	6474	7305	9160	92448	9836
2	2	3	3	3	3	2	2	3/2	3	3	3
4	4	6	6	6	6	4	4	5	6	6	6
15/13	15/15	13/10	13/13	15/13	15/15	25/20	25/25	20/25	20/20	25/20	25/25
128.0	128.0	149.3	149.3	149.3	149.3	168.0	168.0	192.0	222.0	222.0	222.0
2	3	2	3	3	3	3	3	3	3	3	3
13	13	13	13	13	13	13	13	13	13	13	13
4	4	4	4	4	4	6	6	6	8	8	8
2 / 1.4	2 / 1.4	2 / 1.7	2 / 1.7	2 / 1.7	2 / 1.7	2/1.8	2/1.8	2/1.8	2/1.8	2/1.8	2/1.8
1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140
3	3	3	3	3	3	3	3	3	3	3	3
47360	46080	55253	55253	54550	53760	79800	79800	85800	106400	106400	106400

PHYSICAL DATA (METRIC)
YCUL0016E_ - YCUL0140E_

TABLE 15 – PHYSICAL DATA (METRIC)

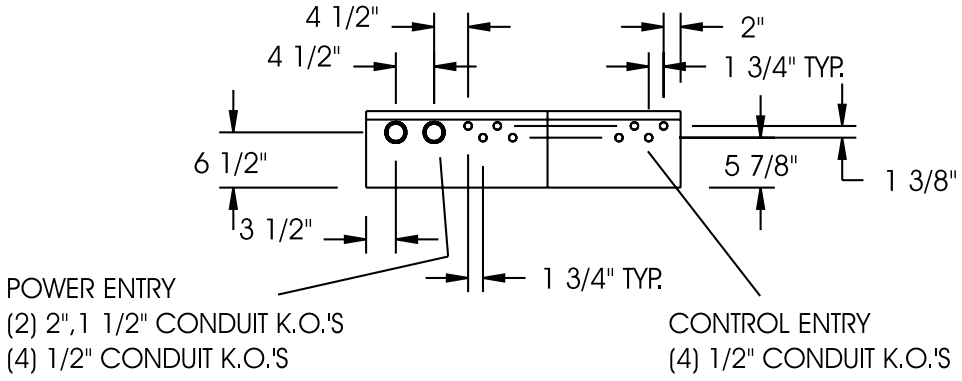
	Model Number YCUL							
	0016	**0026**	**0030**	**0036**	**0040**	**0046**	**0050**	**0056**
General Unit Data								
Nominal kW, R-22	53.5	73.2	91.1	109.7	132.6	148.8	164.9	181.8
Nominal kW, R-407C	51.0	70.7	88.3	108.0	128.7	143.8	160.0	176.6
Number of Refrigerant Circuits	1	1	1	1	1	2	2	2
Refrigerant Charge, Operating								
R-22, ckt1 / ckt2, kg	11.7	13.3	18.7	23.4	24.2	16.4/16.4	19.5/16.4	19.5/19.5
R-407C, ckt1 / ckt2, kg	11.3	12.8	18.0	22.6	23.3	15.8/15.8	18.8/18.8	18.8/18.8
Pumpdown Capacity[1]								
R-22, ckt1 / ckt2, kg	19.6	19.6	27.4	41,1	26.5/26.5	26.5/26.5	26.5/26.5	26.5/26.5
R-407C, ckt1 / ckt2, kg	18.9	18.9	26.4	39.6	26.5/26.5	26.5/26.5	26.5/26.5	26.5/26.5
Oil Charge, ckt1 / ckt2, liters	8.3	8.3	8.3	8.3	12.5	8.3/8.3	8.3/8.3	8.3/8.3
Shipping Weight								
Aluminum Fin Coils, kg	930	933	1089	1109	1265	1791	1814	1840
Copper Fin Coils, kg	998	1001	1157	1177	1333	1927	1950	1976
Compressors, scroll type								
Compressors per circuit	2	2	2	2	3	2	2	2
Compressors per unit	2	2	2	2	3	4	4	4
Nominal kWo per compressor	26	35	46	53	46	35/35	46/35	46/46
Condenser								
Total Face Area meters²	4	4	6	6	6	12	12	12
Number of Rows	2	2	2	3	3	2	2	2
Fins per m	512	512	512	512	512	512	512	512
Condenser Fans								
Number of Fans total	2	2	2	2	2	4	4	4
Fan hp/kw	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4	2 / 1.4
Fan RPM	1140	1140	1140	1140	1140	1140	1140	1140
Number of Blades	3	3	3	3	3	3	3	3
Total Chiller Airflow l/s	7672	7672	11091	11091	11091	22351	22351	22351

NOTES: 1 Pump Down Capacity is based on 100°F (37.8°C) liquid R22 and 80% of condenser volume.
2 Operating Refrigerant Charge is for condensing units only, does not include refrigerant lines and evaporator coil.

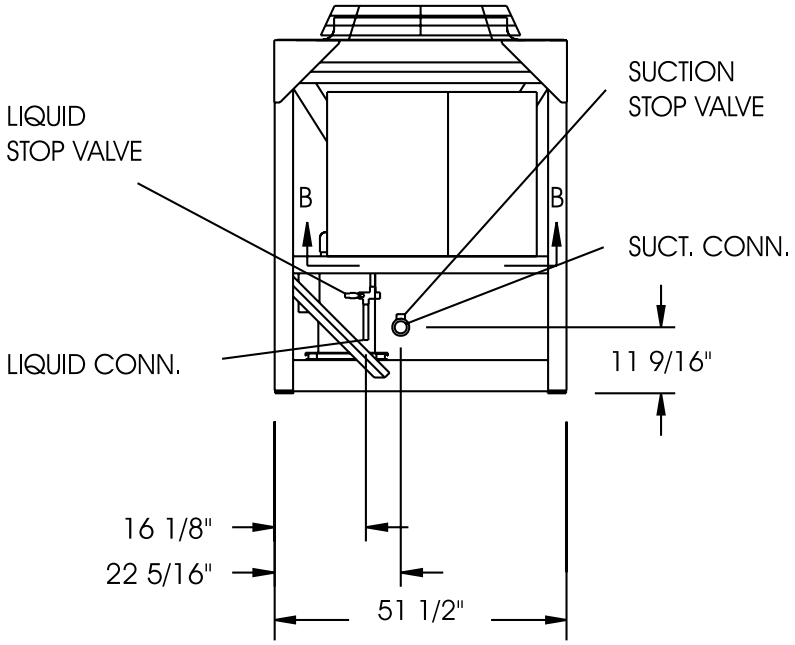
PHYSICAL DATA (METRIC)
YCUL0016E_ - YCUL0140E_

Model Number YCUL											
0060	**0066**	**0076**	**0080**	**0086**	**0090**	**0096**	**0100**	**0106**	**0120**	**0130**	**0140**
197.7	218.8	242.3	270.8	294.0	316.9	319.3	346.1	383.0	429.4	469.9	507.6
193.1	215.6	233.9	263.4	287.7	311.3	306.7	331.3	366.5	413.6	450.2	484.7
2	2	2	2	2	2	2	2	2	2	2	2
28.9/19.5	25.7/25.7	26.5/21.8	35.9/35.9	35.9/35.9	35.9/35.9	39.1/33,2	39.1/39.1	47.3/39.1	48.5/48.5	48.5/48.5	48.5/48.5
27.9/18.8	24.8/24.8	25.5/21.0	34.6/34.6	34.6/34.6	34.6/34.6	37.7/32.0	37.7/37.7	45.6/37.7	46.7/46.7	46.7/46.7	46.7/46.7
26.5/26.5	39.7/39.7	30.9/30.9	46.4/46.4	46.4/46.4	46.4/46.4	68.0/68.0	68.0/68.0	77.2/77.2	88.4/88.4	88.4/88.4	88.4/88.4
25.5/25.5	38.2/38.2	29.8/29.8	44.7/44.7	44.7/44.7	44.7/44.7	66.1/66.1	66.1/66.1	75.1/75.1	85.9/85.9	85.9/85.9	85.9/85.9
8.3/8.3	8.3/8.3	12.5/12.5	12.5/12.5	12.5/12.5	12.5/12.5	16/16	16/16	24/16	24/24	24/24	24/24
1866	1894	2196	2270	2336	2377	2509	2561	2886	3502	3636	3808
2002	2030	2332	2442	2508	2549	2900	2937	3313	4155	4288	4462
2	2	3	3	3	3	2	2	3/2	3	3	3
4	4	6	6	6	6	4	4	5	6	6	6
53/46	53/53	46/35	46/46	53/46	53/53	88/70	88/88	70/88	70/70	88/70	88/88
12	12	14	14	14	14	16.0	16.0	18.0	21.0	21.0	21.0
2	3	2	2	3	3	3	3	3	3	3	3
512	512	512	512	512	512	512	512	512	512	512	512
4	4	4	4	4	4	6	6	6	8	8	8
2 / 1.4	2 / 1.4	2 / 1.7	2 / 1.7	2 / 1.7	2 / 1.7	2 / 1.8	2 / 1.8	2 / 1.8	2 / 1.8	2 / 1.8	2 / 1.8
1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140	1140
3	3	3	3	3	3	3	3	3	3	3	3
22351	21747	26076	26076	25744	25371	37660	37660	39784	50214	50214	50214

DIMENSIONS - YCUL0016 - YCUL0026 (ENGLISH)



VIEW B-B



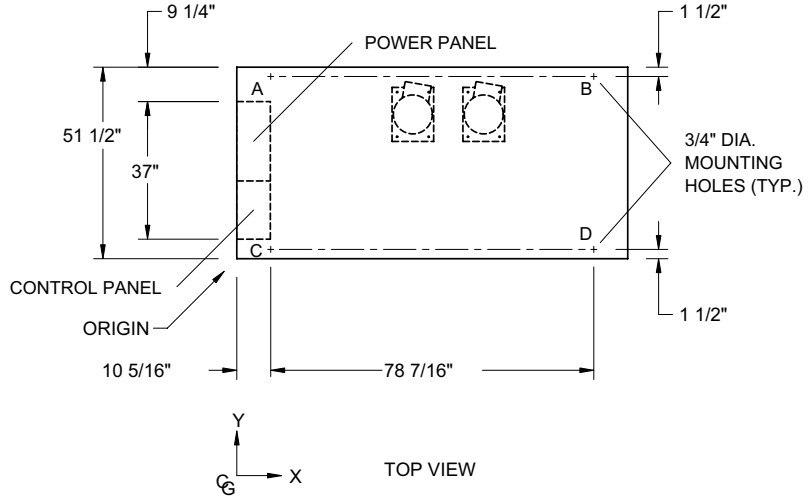
VIEW A-A

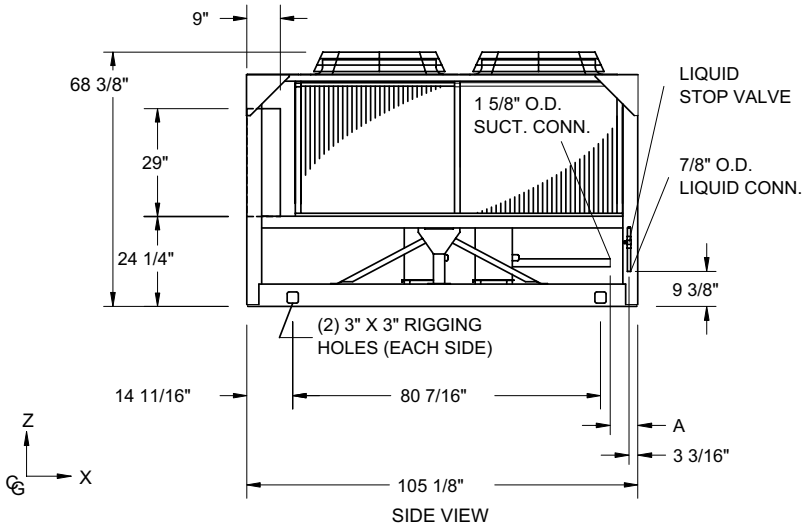
LD04417

MODEL YCUL	A
0016	22 5/16”
0026	22 3/16”

NOTE:

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable airflow patterns and possible diminished performance. YORK’s unit controls will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall – 6'; rear to wall – 6'; control panel to end wall – 4'0; top – no obstructions allowed; distance between adjacent units – 10'. No more than one adjacent wall may be higher than the unit.





MODEL YCUL	A
0016	7 3/8”
0026	5 1/4”

LD08727

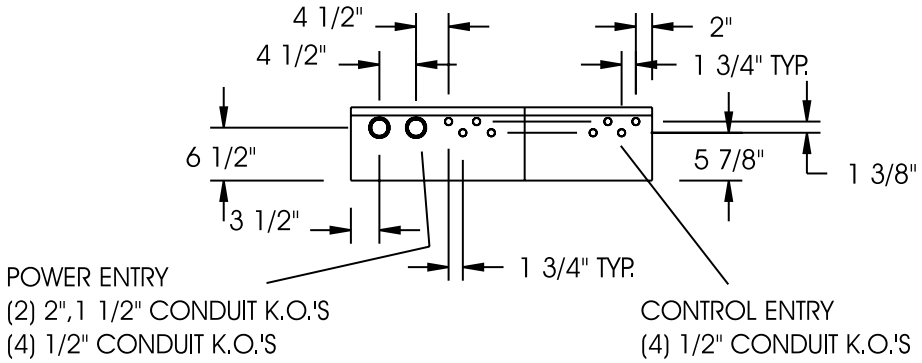
ALUMINUM COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0016	45.5	26.3	31.8
0026	45.5	26.3	31.7

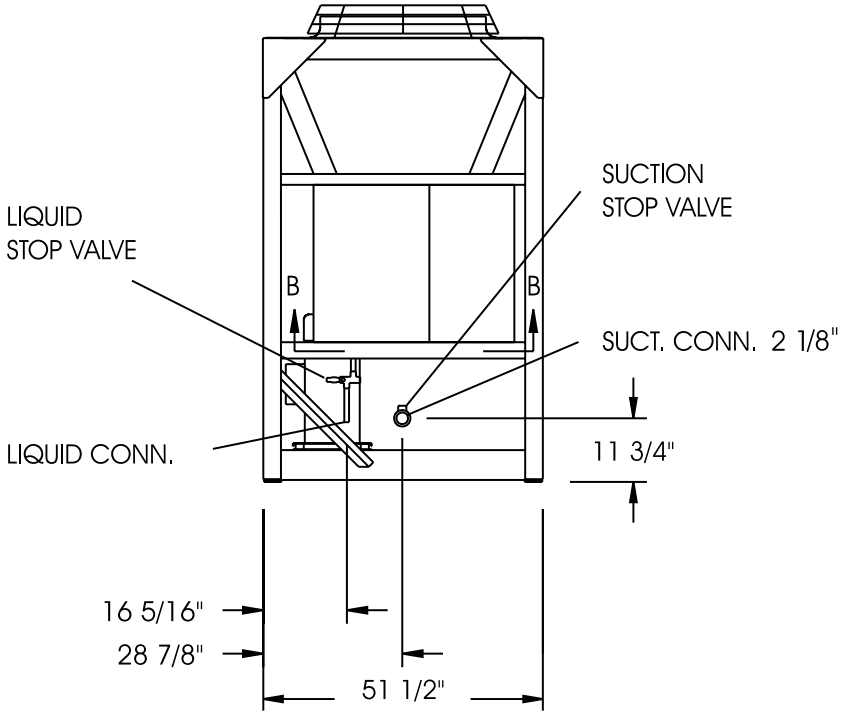
COPPER COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0016	44.3	25.4	31.0
0026	44.3	25.3	31.0

DIMENSIONS - YCUL0030 - YCUL0036 (ENGLISH)



VIEW B-B



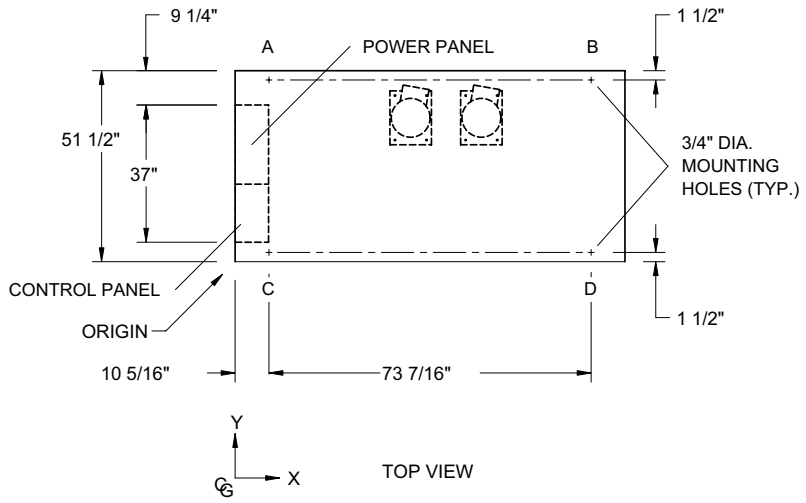
VIEW A-A

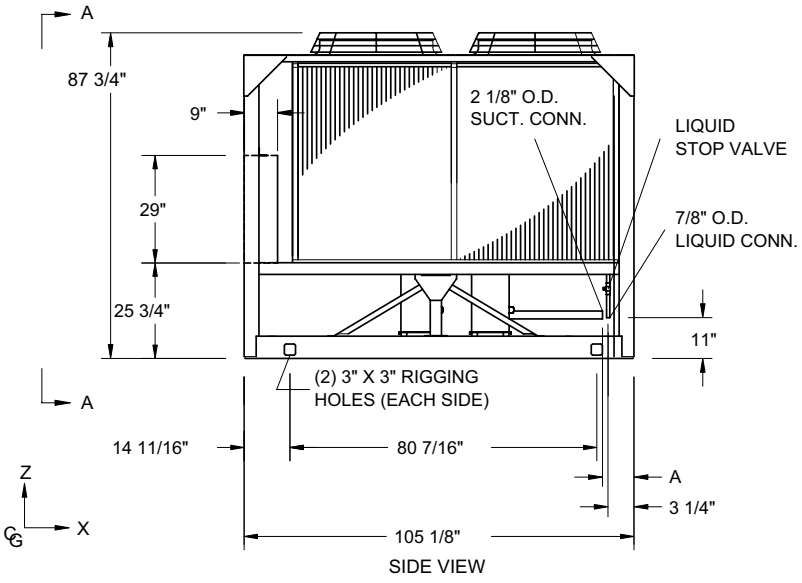
MODEL YCUL	A	B
0030	16 5/16”	28 7/8”
0036	14 1/2”	22 1/4”

LD04421

NOTE:

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable airflow patterns and possible diminished performance. YORK’s unit controls will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall – 6'; rear to wall – 6'; control panel to end wall – 4'; top – no obstructions allowed; distance between adjacent units – 10'. No more than one adjacent wall may be higher than the unit.





MODEL YCUL	A
0030	5 15/16”
0036	4 3/4”

LD08728

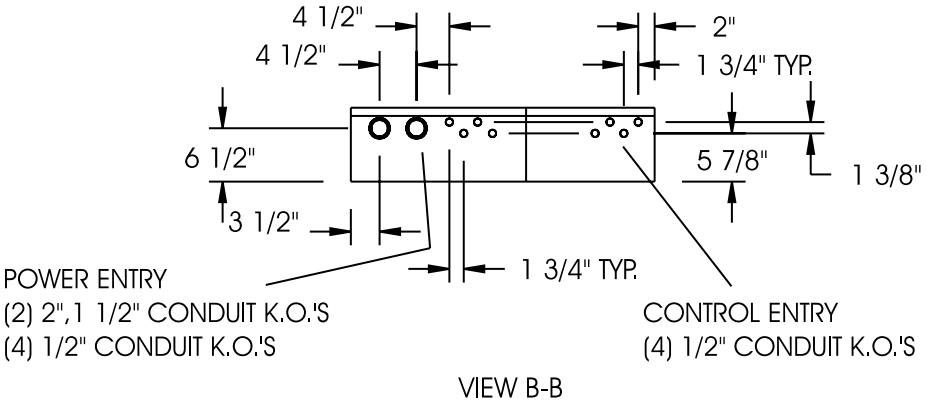
ALUMINUM COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0030	44.3	26.4	39.5
0036	44.4	26.6	39.3

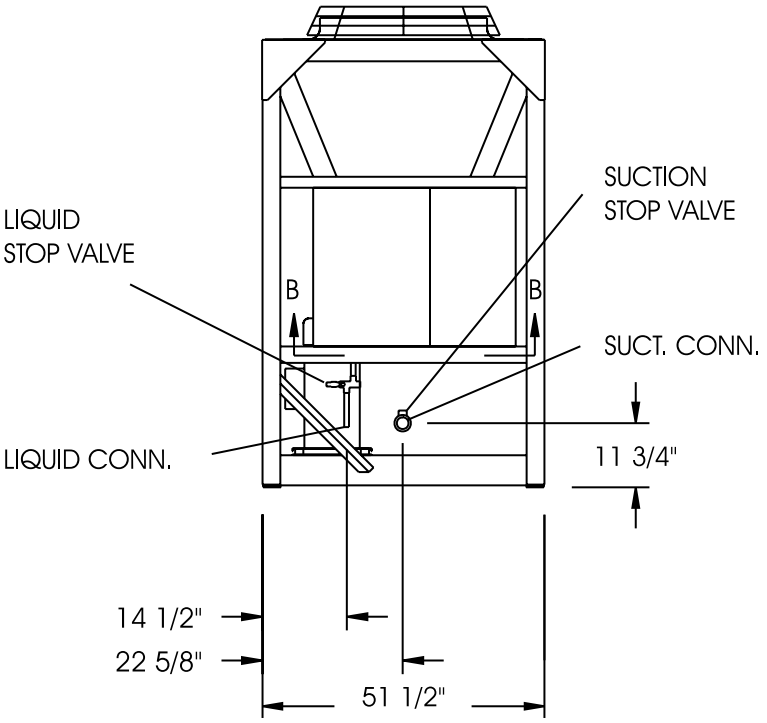
COPPER COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0030	43.4	25.6	38.8
0036	43.4	25.8	38.6

DIMENSIONS - YCUL0040 (ENGLISH)



VIEW B-B

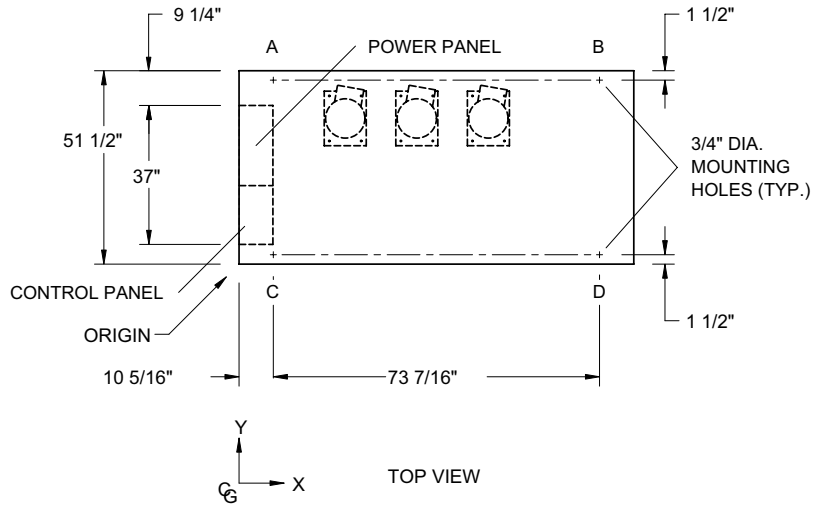


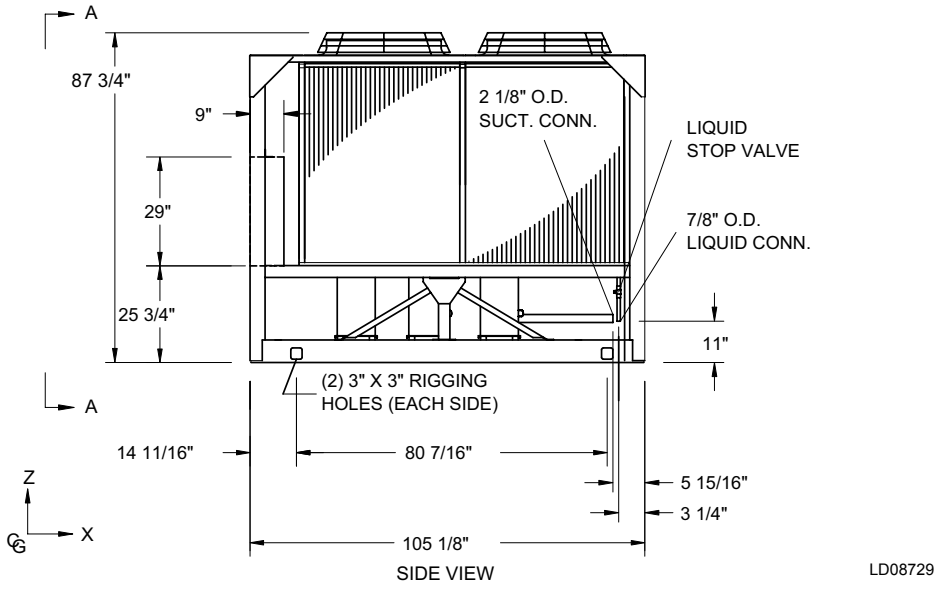
LD04425

VIEW A-A

NOTE:

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable airflow patterns and possible diminished performance. YORK's unit controls will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall – 6'; rear to wall – 6'; control panel to end wall – 4'; top – no obstructions allowed; distance between adjacent units – 10'. No more than one adjacent wall may be higher than the unit.





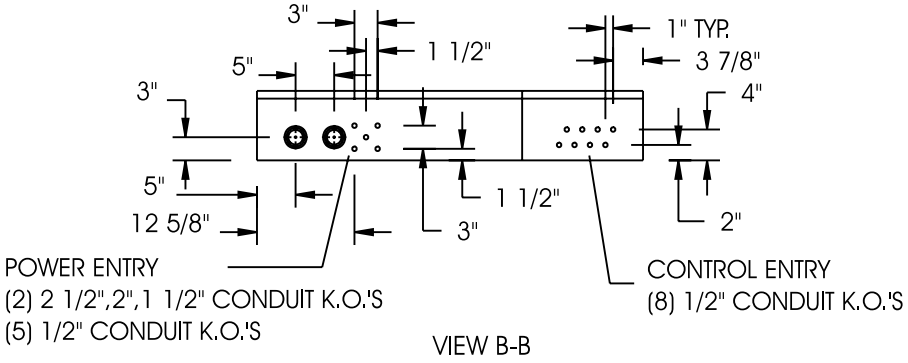
ALUMINUM COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0040	44.4	27.6	37.5

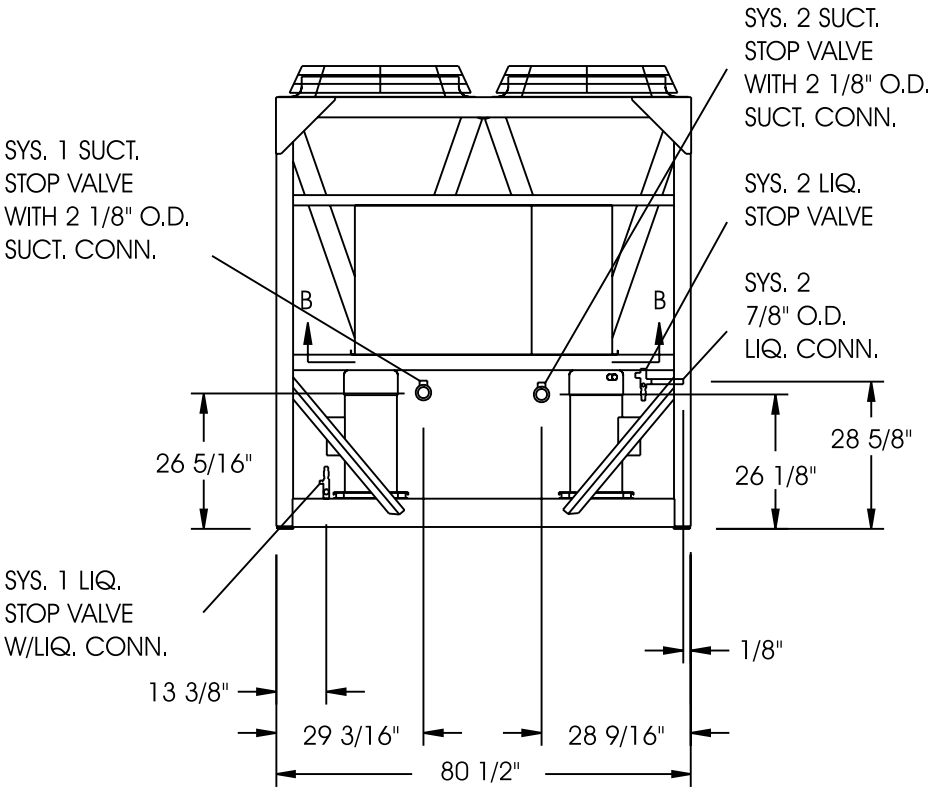
COPPER COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0040	43.5	26.9	36.9

DIMENSIONS - YCUL0046 - YCUL0066 (ENGLISH)



VIEW B-B



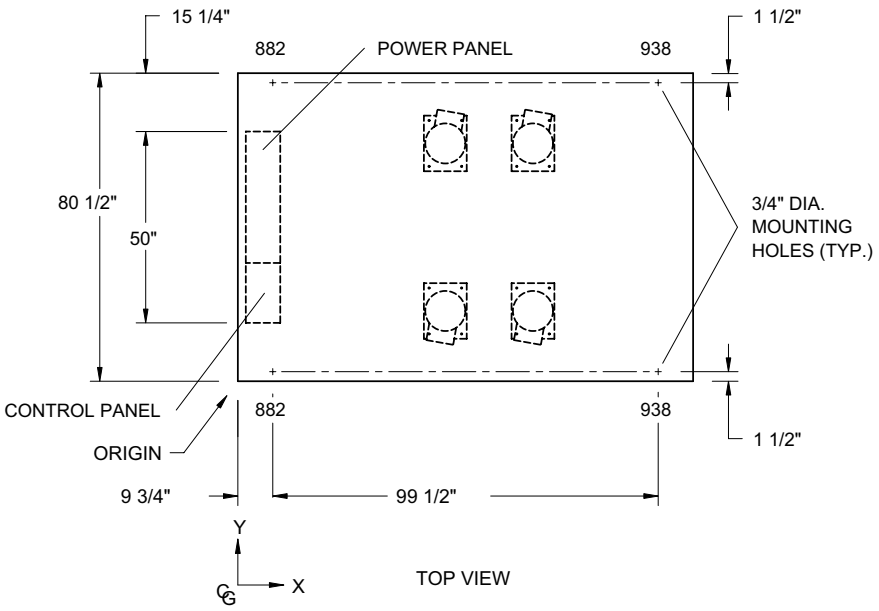
VIEW A-A

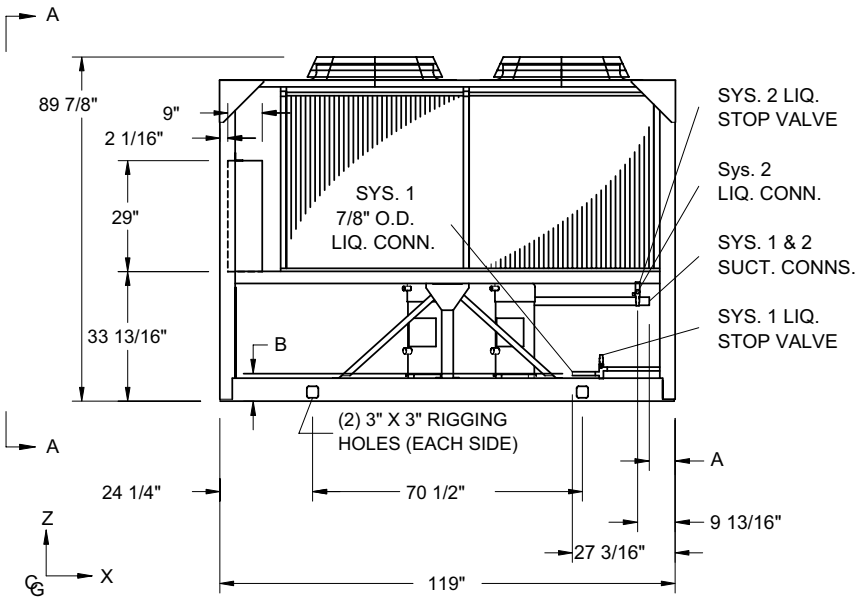
LD04427

MODEL YCUL	A	B
0046	7/8” OD	1/8”
0050	7/8” OD	1/4”
0056	7/8” OD	1/4”
0060	7/8” OD	1/4”
0066	1 1/8” OD	1/4”

NOTE:

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable airflow patterns and possible diminished performance. YORK’s unit controls will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall – 6'; rear to wall – 6'; control panel to end wall – 4'; top – no obstructions allowed; distance between adjacent units – 10'. No more than one adjacent wall may be higher than the unit.





LD08730

MODEL YCUL	A	B
0046	6 15/16”	7 3/16”
0050	6 15/16”	7 3/16”
0056	6 15/16”	7 3/16”
0060	6 11/16”	7 3/16”
0066	6 15/16”	5 7/8”

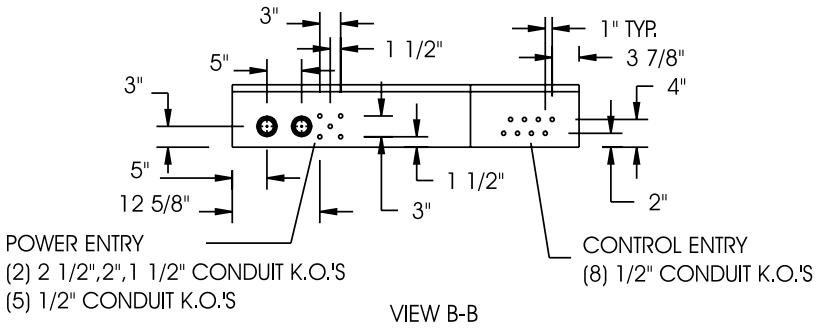
ALUMINUM COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0046	59.7	40.2	46.6
0050	59.5	40.5	45.6
0056	59.5	40.2	45.3
0060	59.6	40.4	45.2
0066	59.7	40.2	45.0

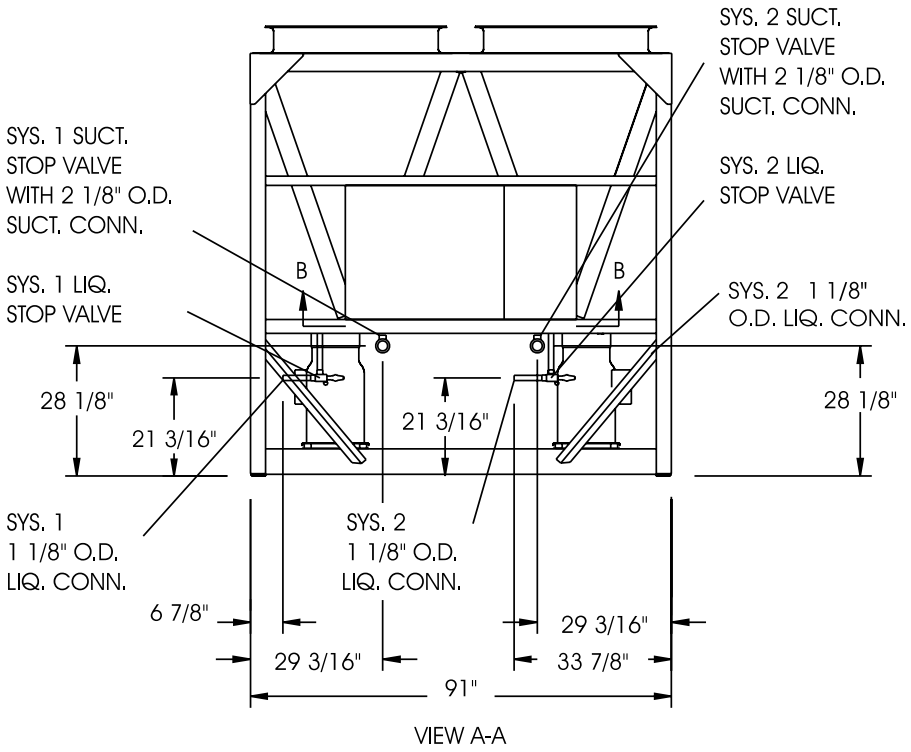
COPPER COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0046	59.8	40.2	46.8
0050	59.8	40.4	46.4
0056	59.9	40.2	46.1
0060	59.9	40.4	46.0
0066	60.0	40.2	45.9

DIMENSIONS - YCUL0076 - YCUL0090 (ENGLISH)



VIEW B-B



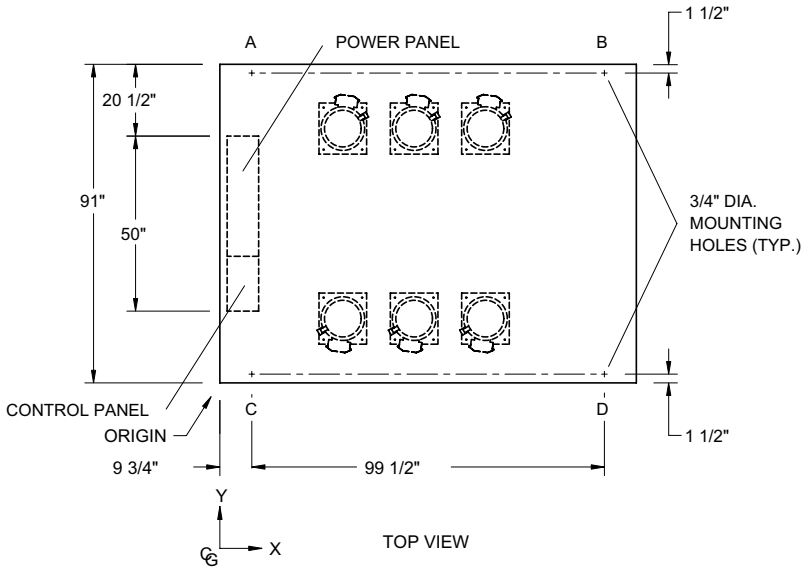
VIEW A-A

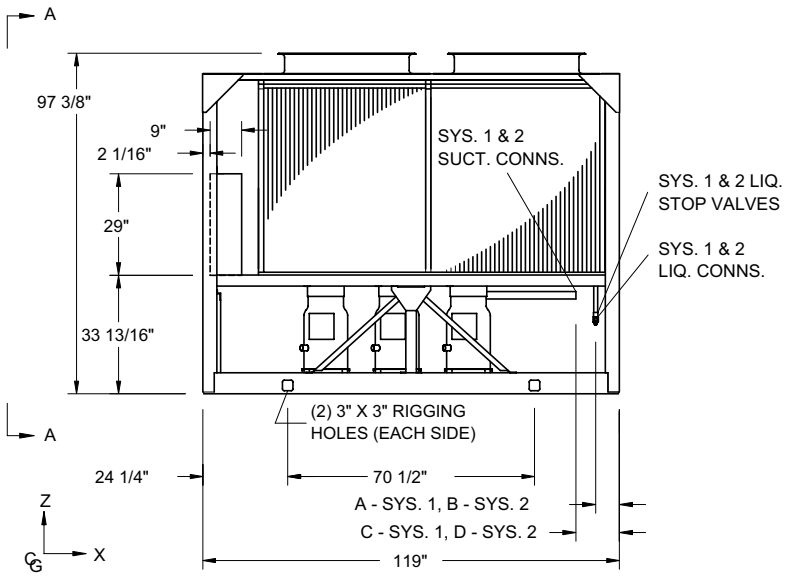
MODEL YCUL	A	B	C	D	E	F
0076	2 1/8" OD	2 1/8" OD	29 3/16"	33 7/8"	6 7/8"	29 3/16"
0080	2 1/8" OD	2 1/8" OD	29 3/16"	33 7/8"	6 7/8"	29 3/16"
0086	2 1/8" OD	2 1/8" OD	29 3/16"	16 15/16"	5 3/16"	28 9/16"
0090	2 5/8" OD	2 5/8" OD	28 9/16"	16 15/16"	5 3/16"	28 9/16"

LD04435

NOTE:

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable airflow patterns and possible diminished performance. YORK's unit controls will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall – 6'; rear to wall – 6'; control panel to end wall – 4'0; top – no obstructions allowed; distance between adjacent units – 10'. No more than one adjacent wall may be higher than the unit.





MODEL YCUL	A	B
0076	3 5/16”	3 3/16”
0080	3 5/16”	3 3/16”
0086	3 3/16”	3 1/4”
0090	3 3/16”	3 1/4”
MODEL YCUL	**C**	**D**
0076	7 7/8”	11 9/16”
0080	7 7/8”	11 9/16”
0086	6 13/16”	11 9/16”
0090	10”	14 3/8”

LD08731

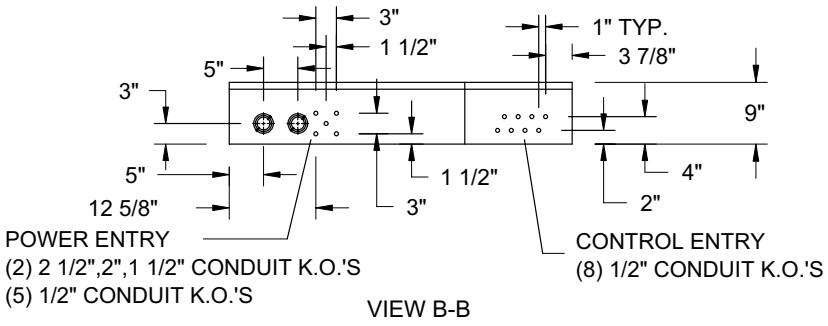
ALUMINUM COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0076	57.3	45.9	45.2
0080	57.4	45.5	45.1
0086	57.4	45.8	45.0
0090	57.4	45.5	44.9

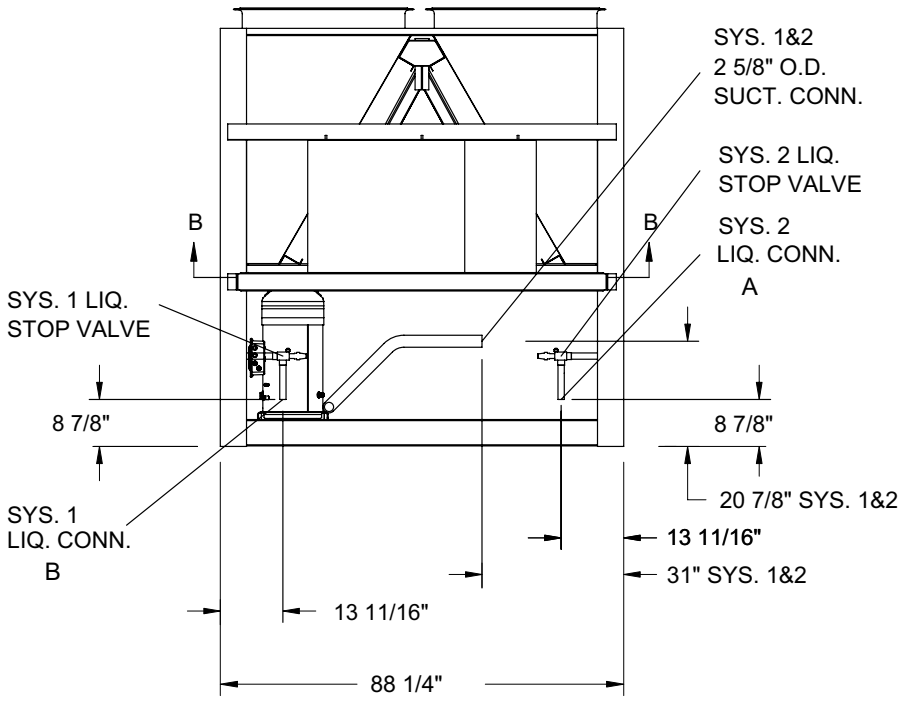
COPPER COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0076	57.7	45.8	46.2
0080	57.8	45.5	46.3
0086	57.8	45.8	46.2
0090	57.8	45.5	46.0

DIMENSIONS - YCUL0096 - YCUL0100 (ENGLISH)



VIEW B-B



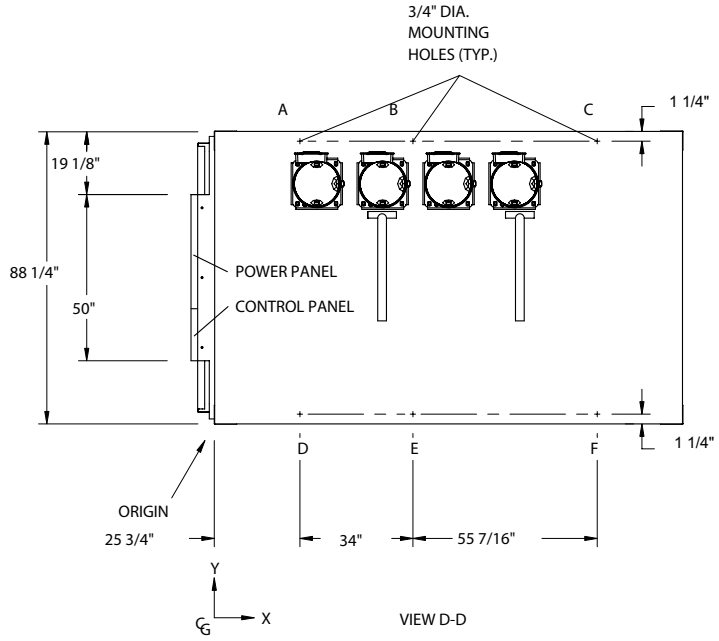
VIEW A-A

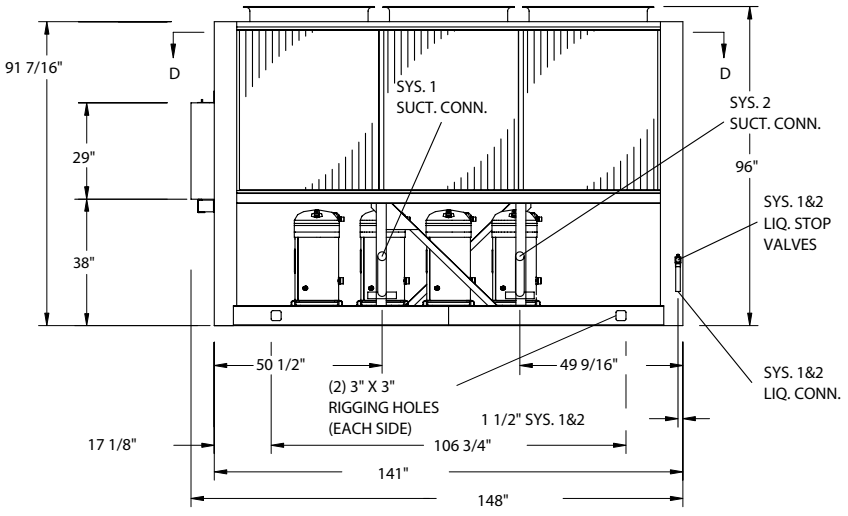
MODEL YCUL	A	B
0096	1 1/8” OD	1 1/8” OD
0100	1 3/8” OD	1 3/8” OD

LD08712

NOTE:

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable airflow patterns and possible diminished performance. YORK’s unit controls will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall – 6'; rear to wall – 6'; control panel to end wall – 4'0; top – no obstructions allowed; distance between adjacent units – 10'. No more than one adjacent wall may be higher than the unit.





LD08713

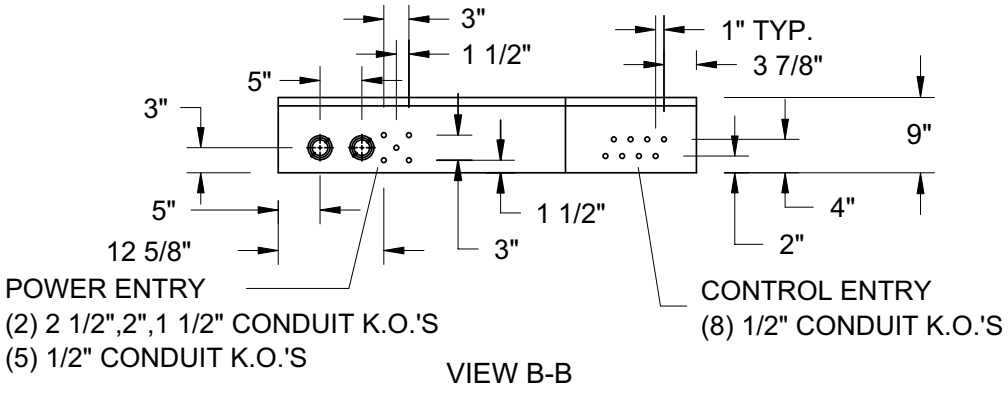
ALUMINUM COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0096	64.0	50.9	48.4
0100	64.9	50.9	48.1

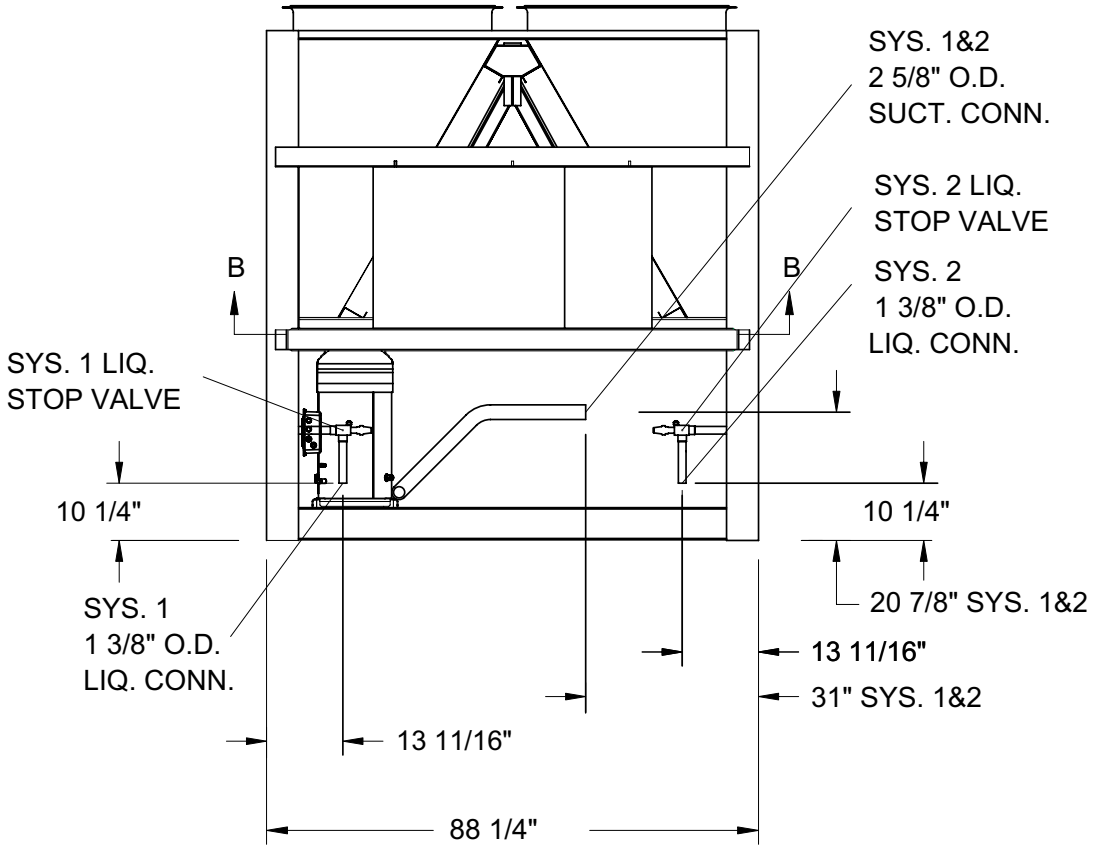
COPPER COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0096	64.8	50.0	50.5
0100	65.6	50.1	50.1

DIMENSIONS - YCUL0106 (ENGLISH)



VIEW B-B



VIEW A-A

LD08714

NOTE:

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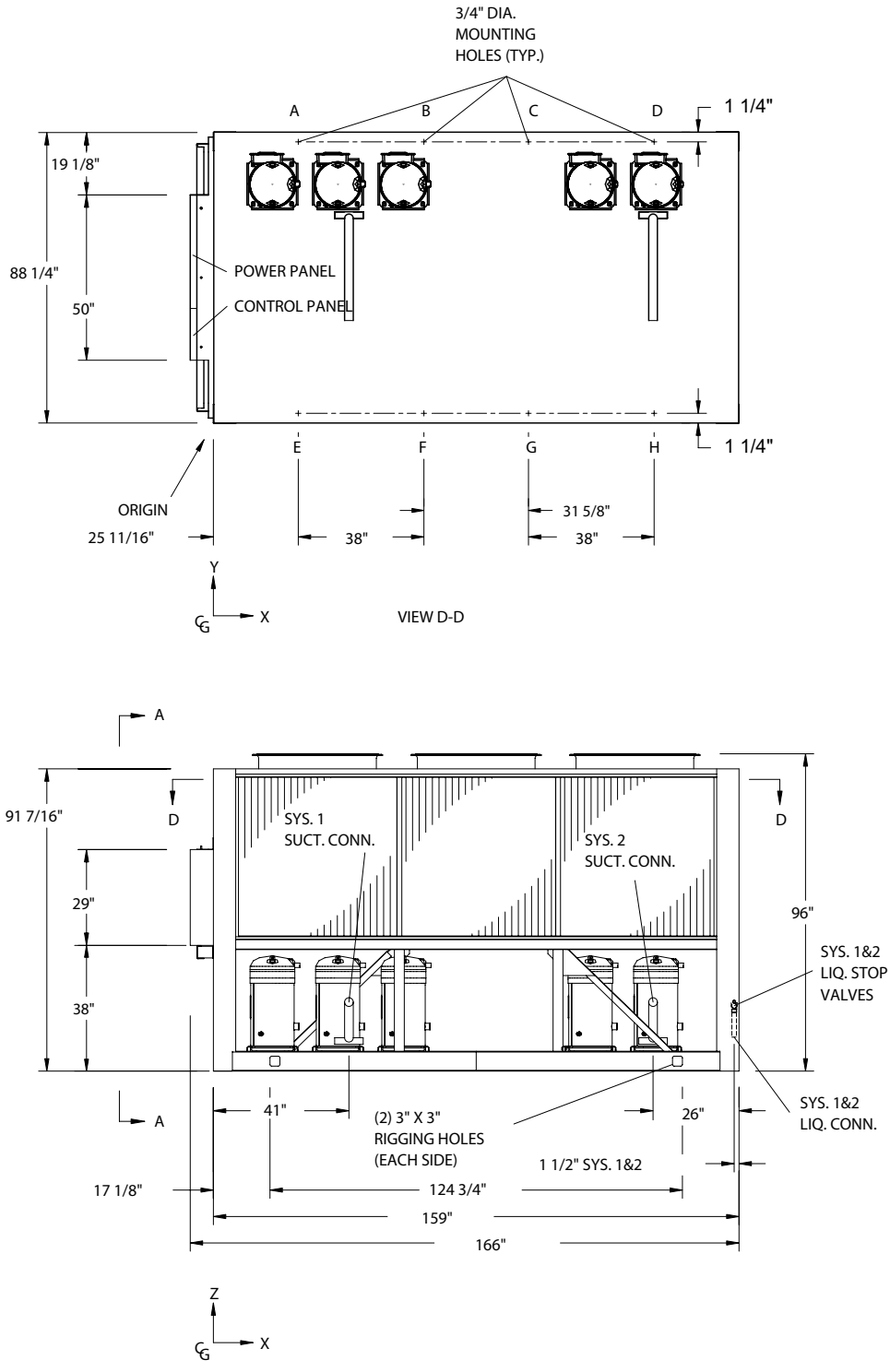


LD08715

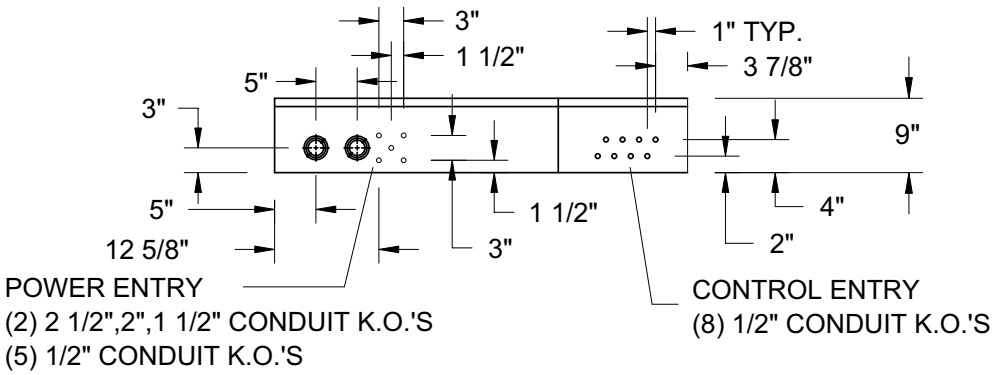
ALUMINUM COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0106	73.9	51.4	46.7

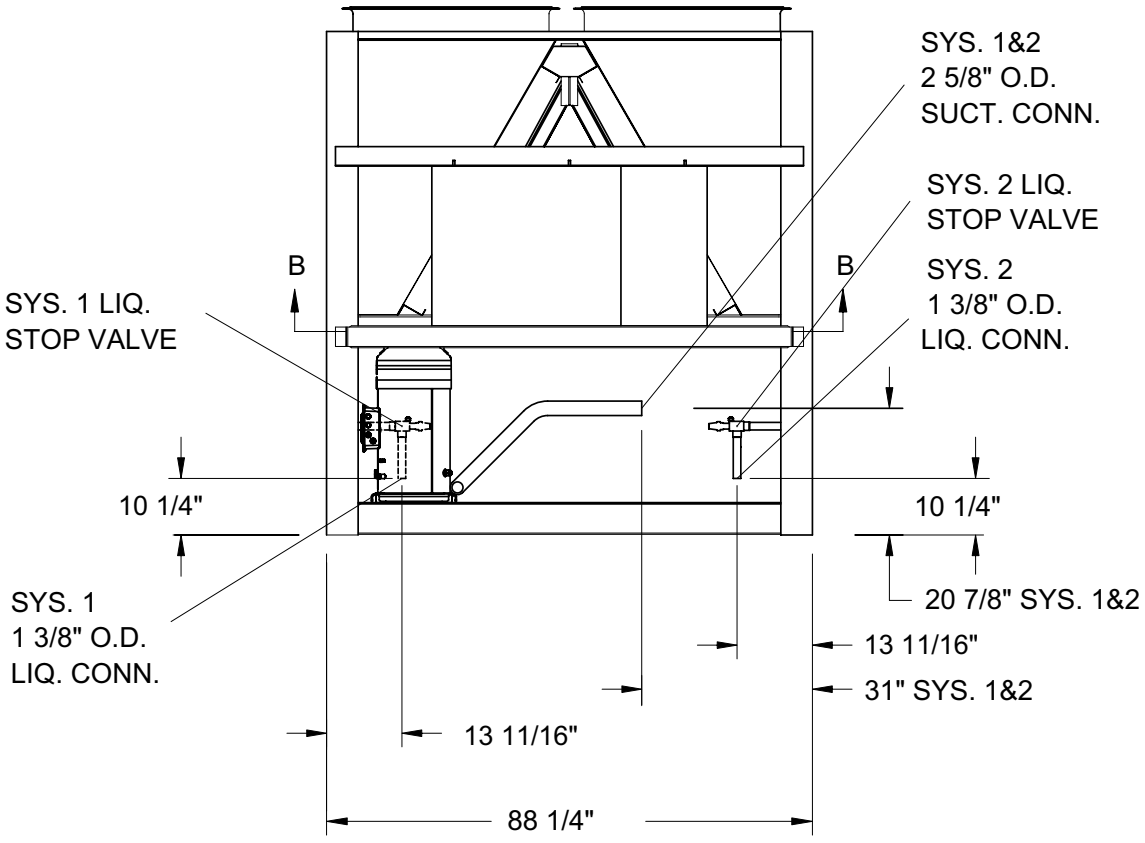
COPPER COIL

YCUL	Center of Gravity (in.)		
	X	Y	Z
0106	74.6	50.4	48.1

DIMENSIONS - YCUL0120 - YCUL0140 (ENGLISH)



VIEW B-B



VIEW A-A

LD08716

NOTE:

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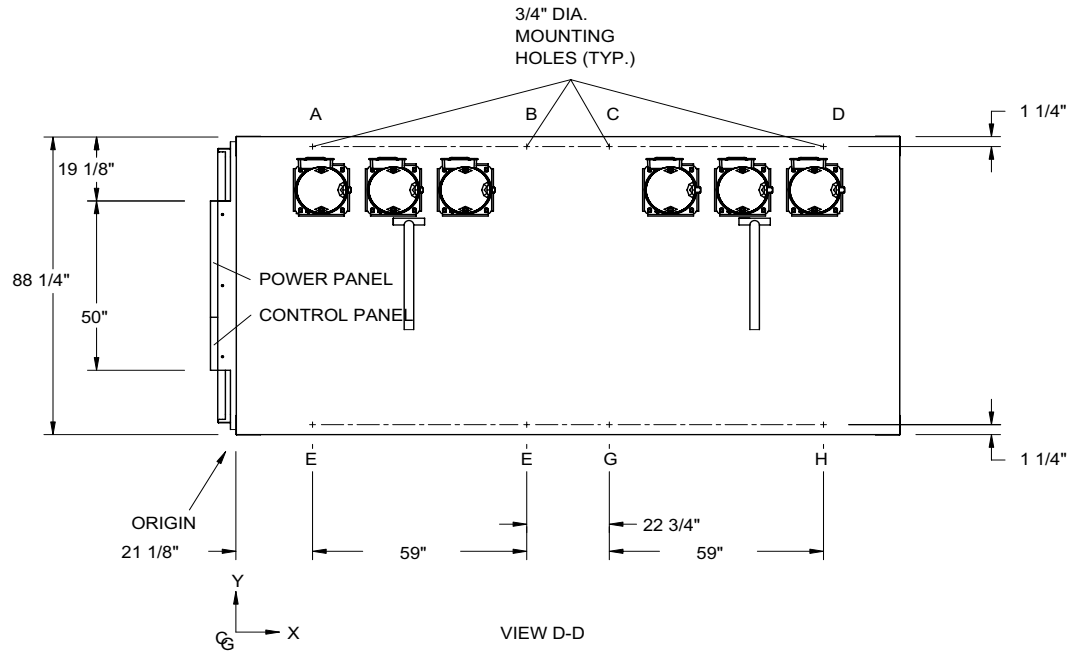
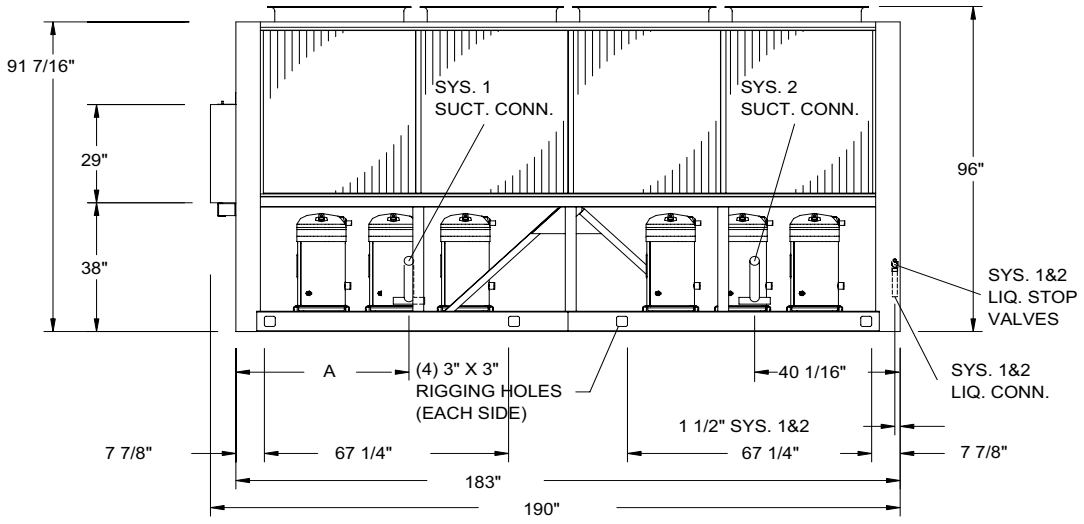
DIMENSIONS - YCUL0120 - YCUL0140 (ENGLISH)





LD08717

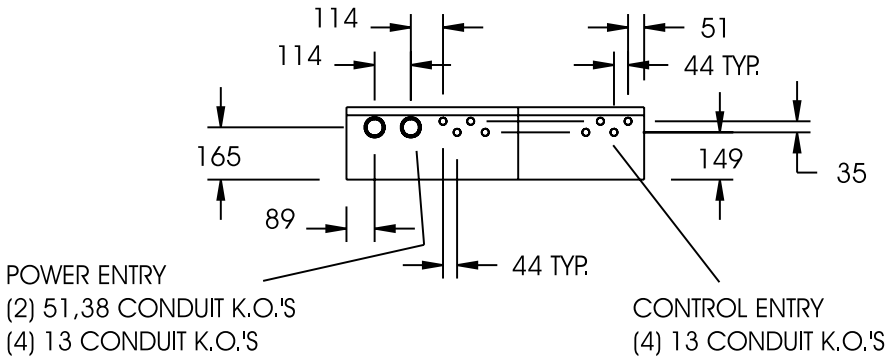
ALUMINUM

YCUL	Center of Gravity (in.)		
	X	Y	Z
0120	86.6	51.3	49.8
0130	85.1	52.0	48.7
0140	85.8	52.5	47.8

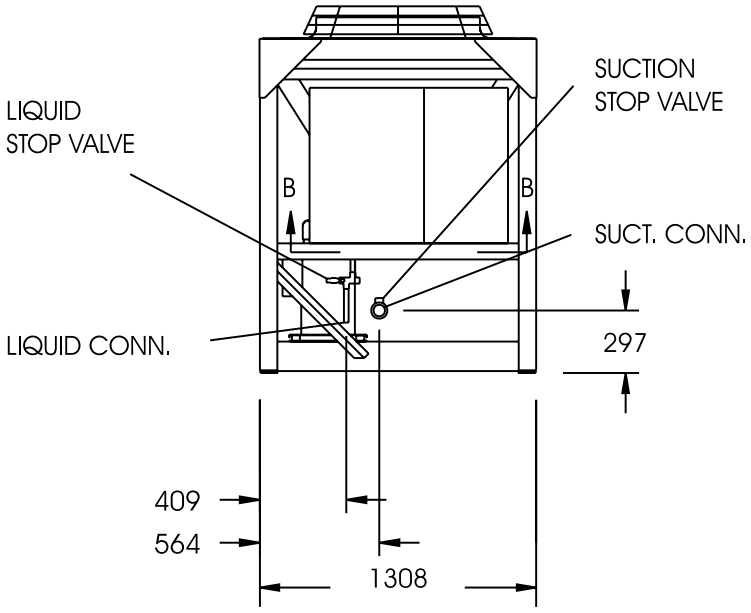
COPPER

YCUL	Center of Gravity (in.)		
	X	Y	Z
0120	87.3	50.2	50.8
0130	85.9	50.9	49.9
0140	86.6	51.4	49.1

DIMENSIONS - YCUL0016 - YCUL0026 (SI)



VIEW B-B



VIEW A-A

MODEL YCUL	A
0016	567
0026	564

LD04445

NOTE:

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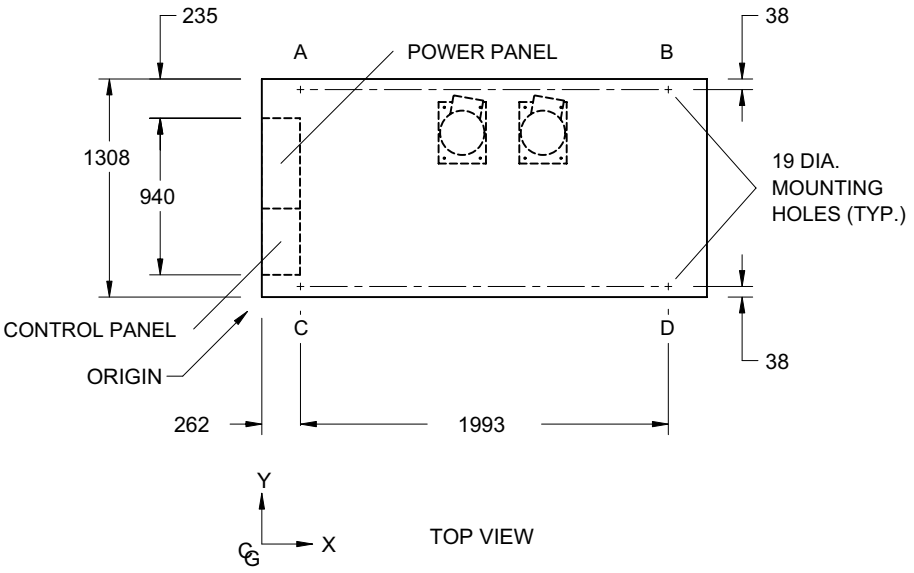
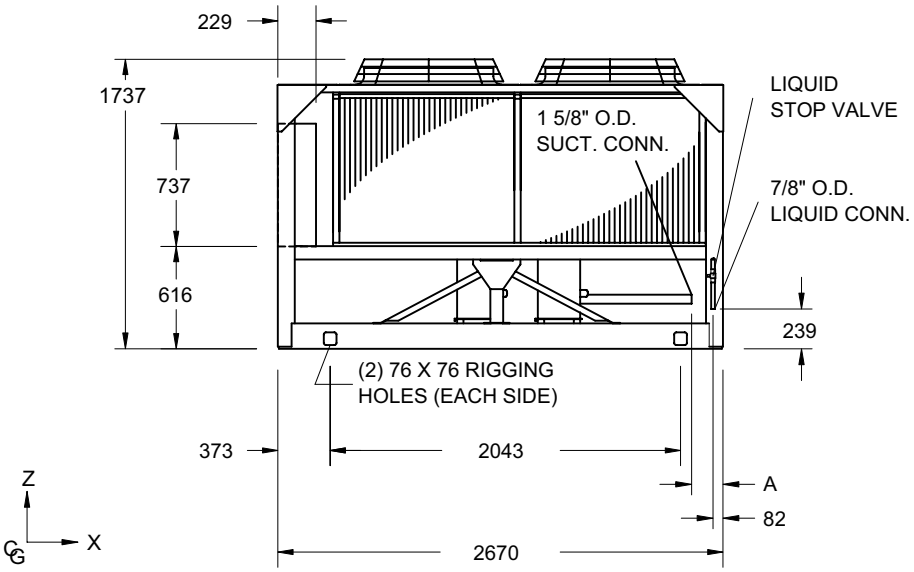




MODEL YCUL	A
0016	187
0026	133

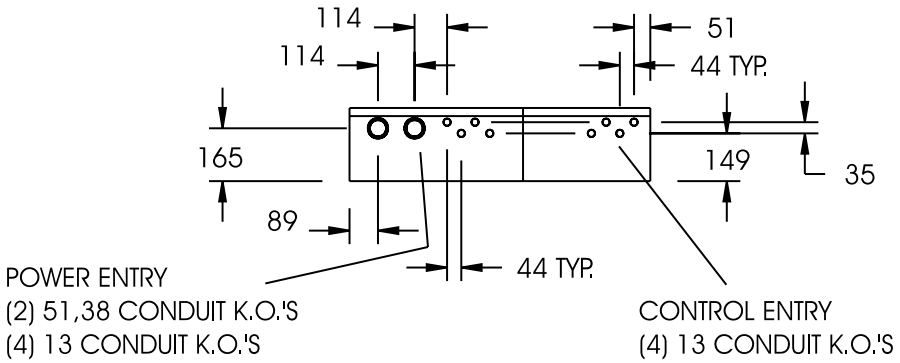
ALUMINUM COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0016	1155	668	807
0026	1155	667	806

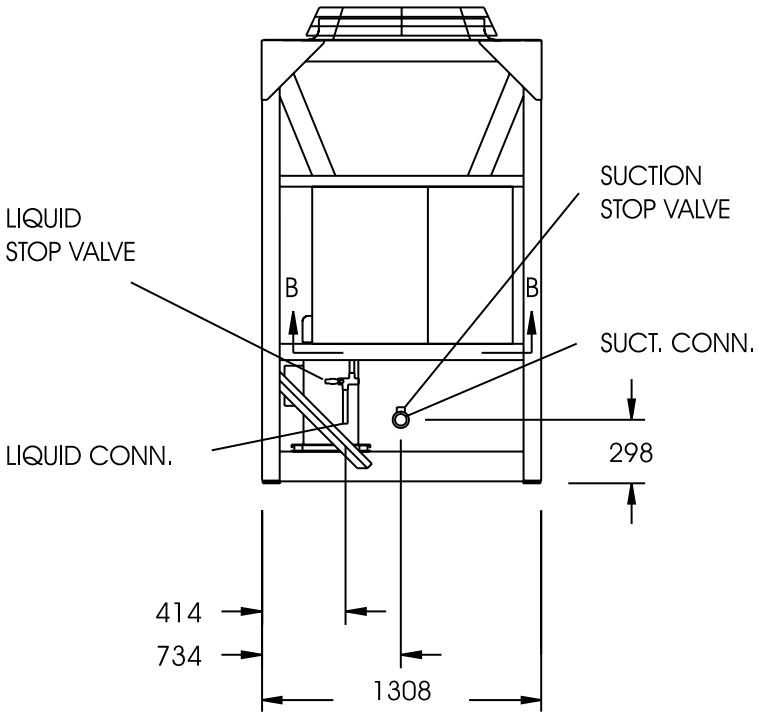
COPPER COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0016	1,125	644	788
0026	1,125	644	788

DIMENSIONS - YCUL0030 - YCUL0036 (SI)



VIEW B-B



VIEW A-A

MODEL YCUL	A	B
0030	414	733
0036	368	565

LD04447

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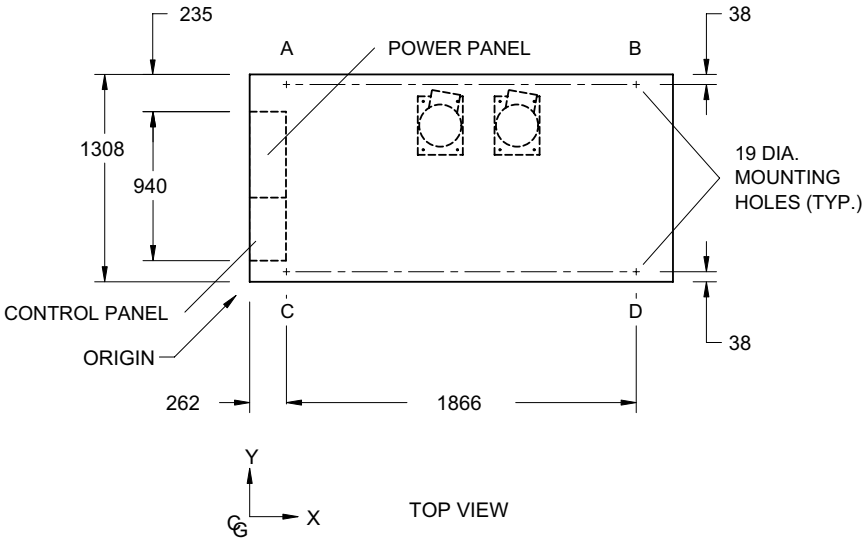
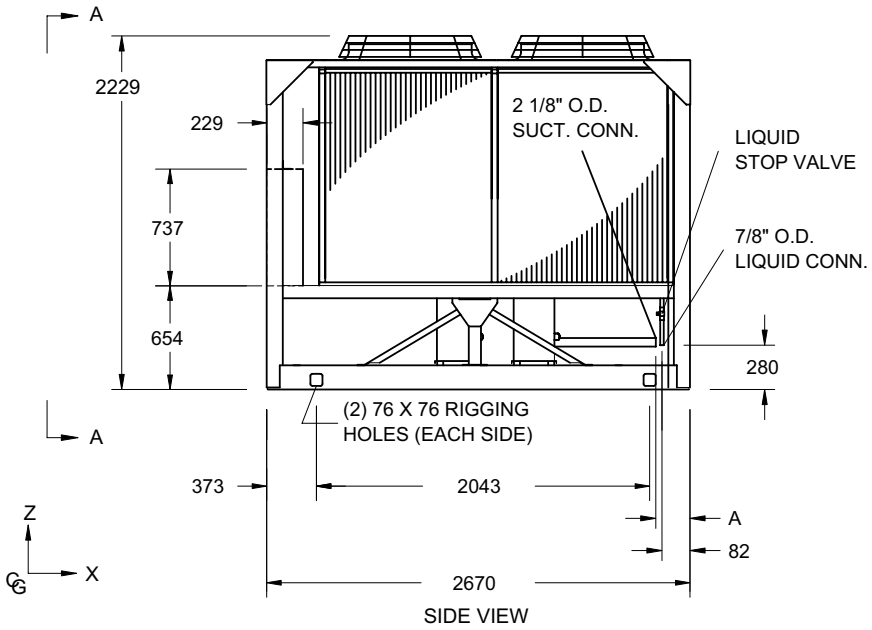




MODEL YCUL	A
0030	151
0036	121

LD08733

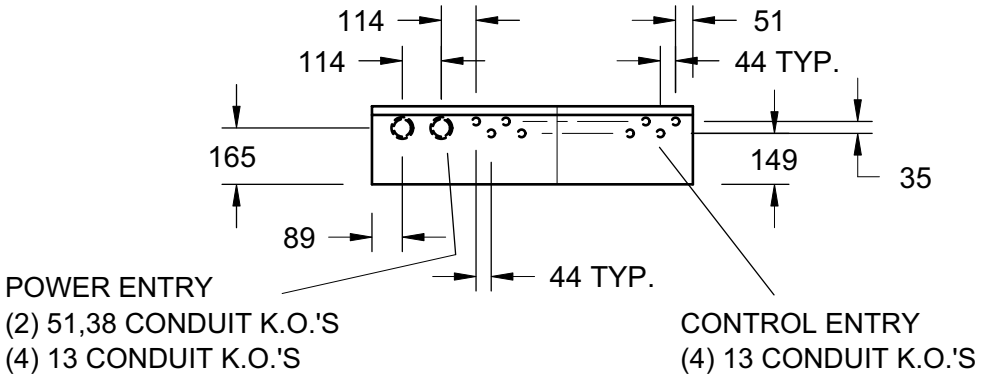
ALUMINUM COIL

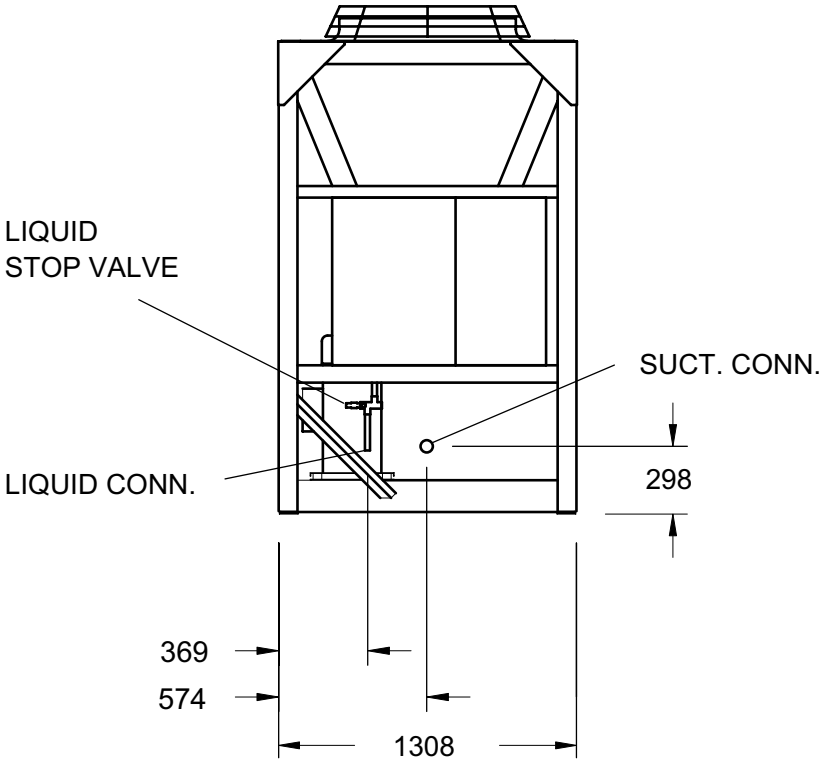
YCUL	Center of Gravity (mm)		
	X	Y	Z
0030	1126	671	1004
0036	1127	676	999

COPPER COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0030	1,102	650	985
0036	1,103	656	980

DIMENSIONS - YCUL0040 (SI)





LD08718

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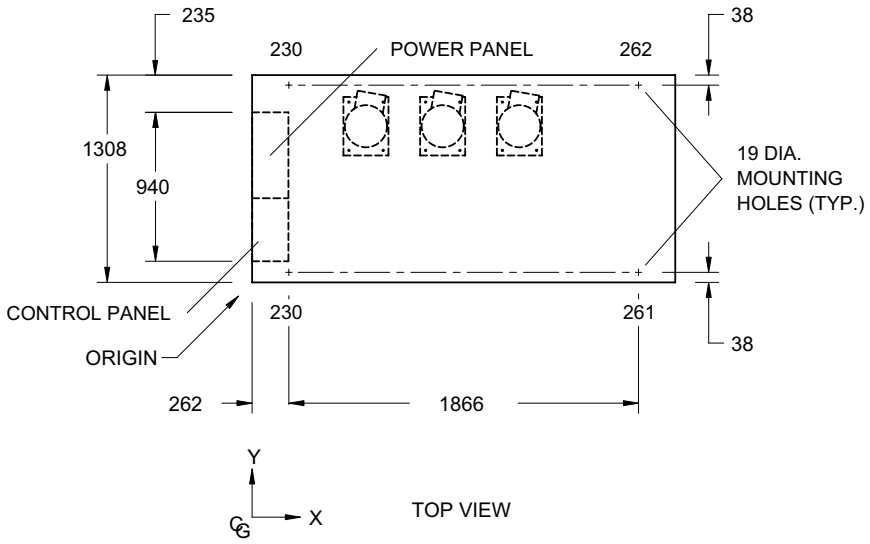
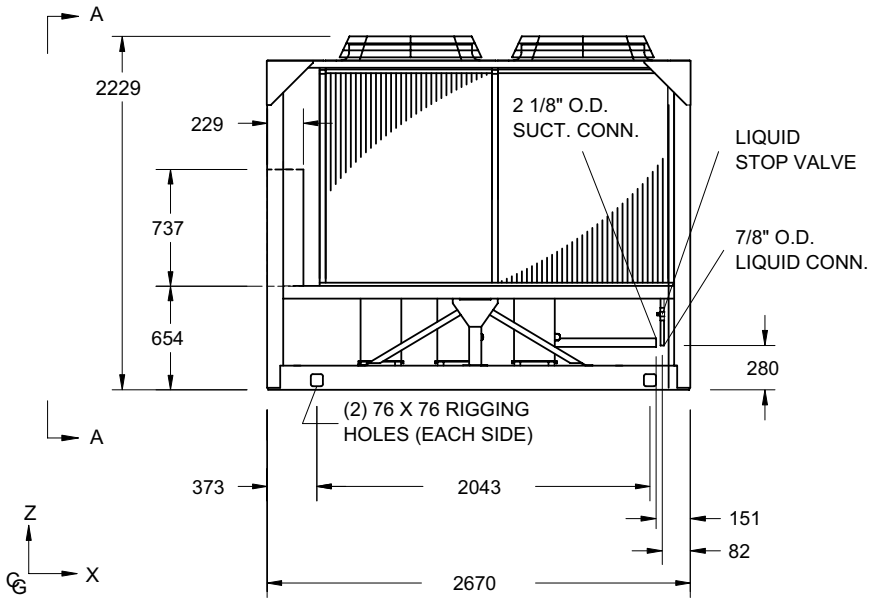




LD08719

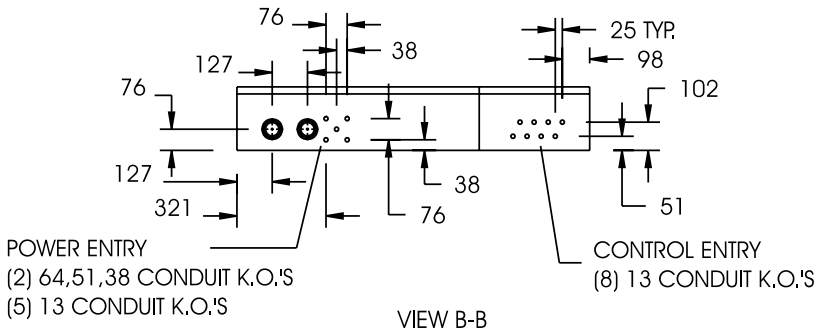
ALUMINUM COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0040	1127	701	953

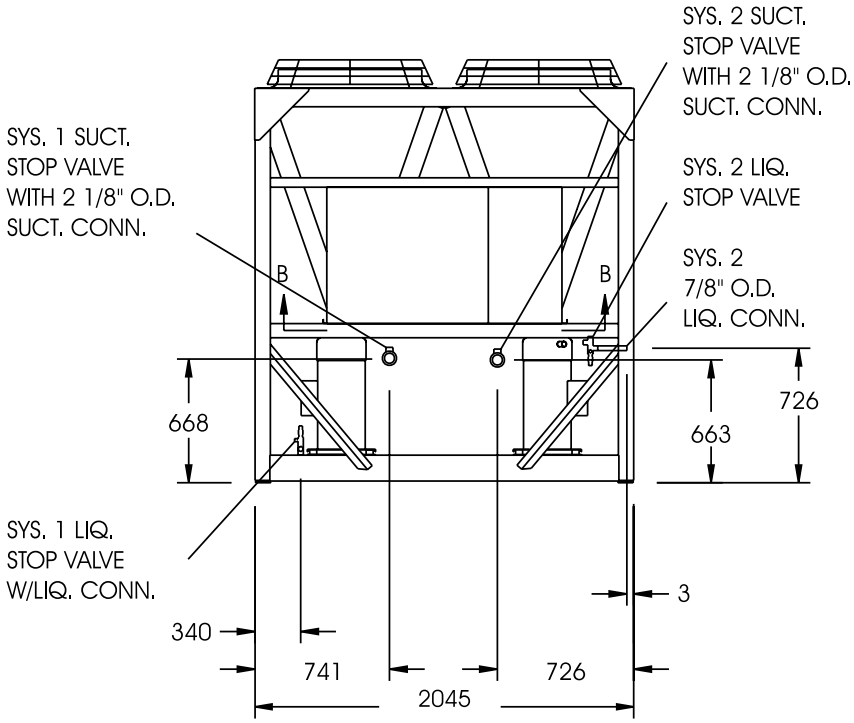
COPPER COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0040	1,106	682	938

DIMENSIONS - YCUL0046 - YCUL0066 (SI)



VIEW B-B



VIEW A-A

MODEL YCUL	A	B
0046	7/8” OD	3
0050	7/8” OD	6
0056	7/8” OD	6
0060	7/8” OD	6
0066	1 1/8” OD	6

LD04453

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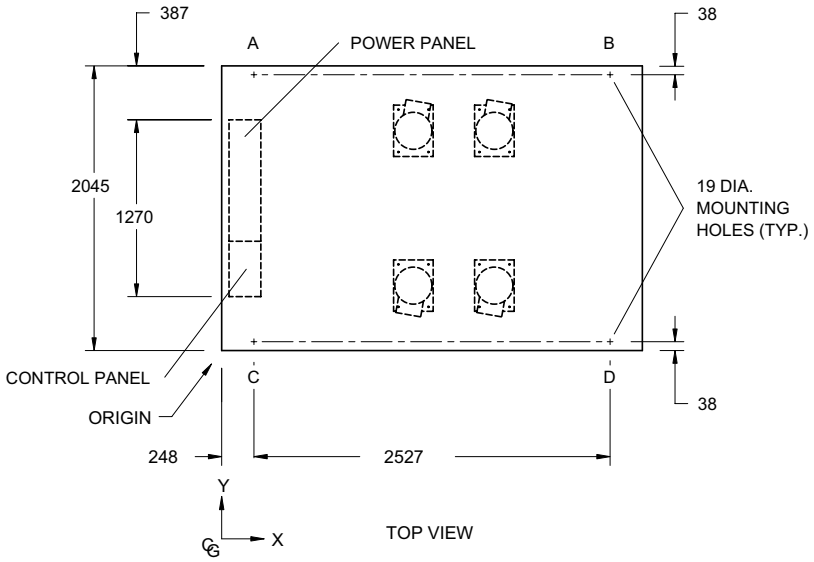
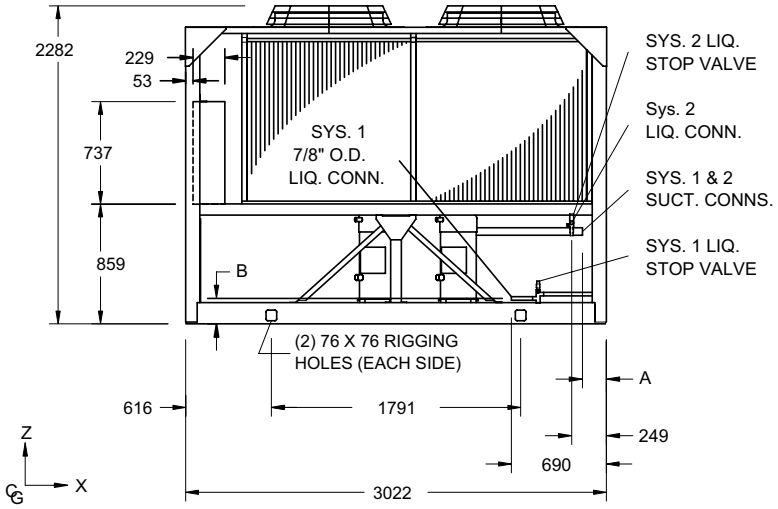




MODEL YCUL	A	B
0046	176	183
0050	176	183
0056	176	183
0060	170	183
0066	176	149

LD08734

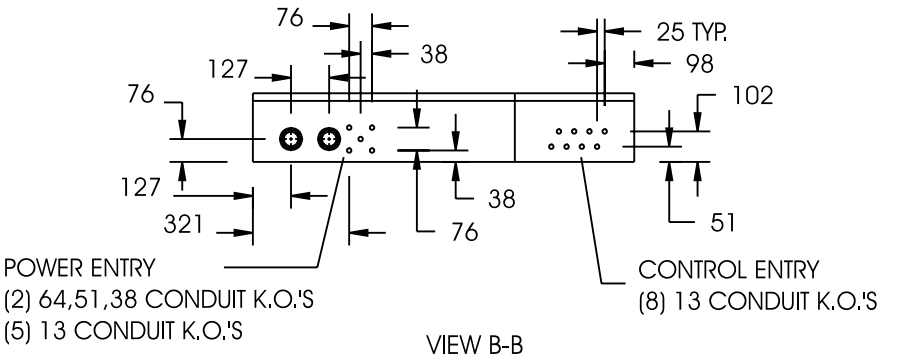
ALUMINUM COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0046	1517	1021	1184
0050	1511	1027	1158
0056	1512	1021	1151
0060	1514	1026	1147
0066	1515	1021	1144

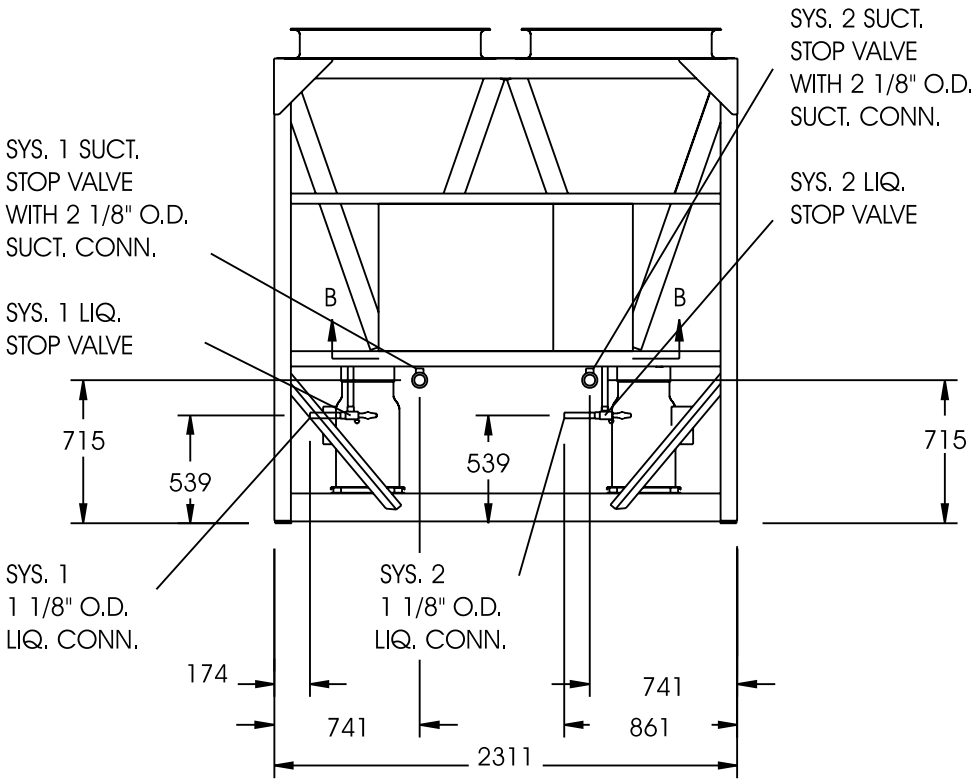
COPPER COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0046	1518	1021	1187
0050	1519	1027	1180
0056	1520	1021	1172
0060	1521	1026	1169
0066	1523	1021	1165

DIMENSIONS - YCUL0076 - YCUL0090 (SI)



VIEW B-B



VIEW A-A

LD04463

MODEL YCUL	A	B	C	D	E	F
0076	2 1/8" OD	2 1/8" OD	741	860	175	741
0080	2 1/8" OD	2 1/8" OD	741	860	175	741
0086	2 1/8" OD	2 1/8" OD	741	430	132	725
0090	2 5/8" OD	2 5/8" OD	725	430	132	725

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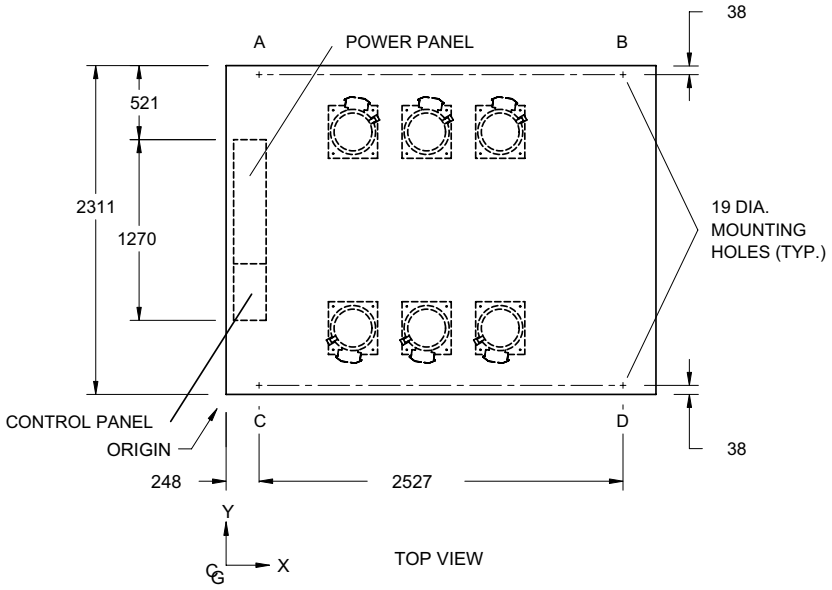
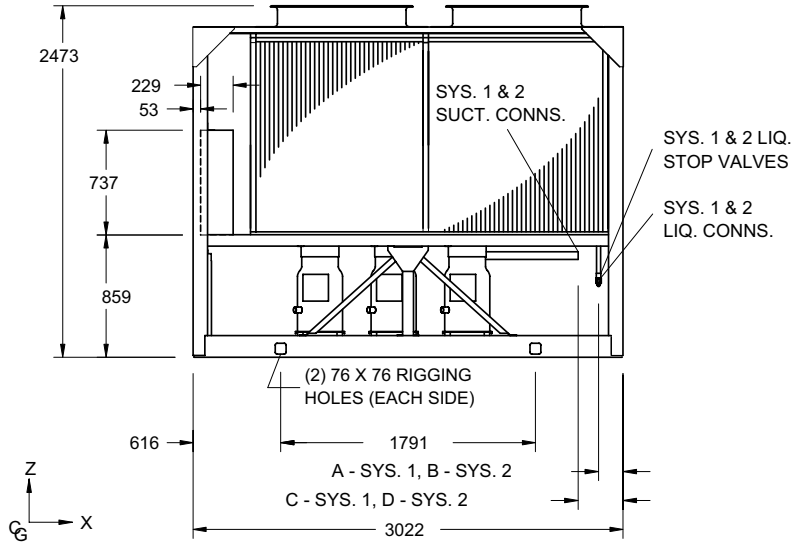




MODEL YCUL	A	B
0076	84	81
0080	84	81
0086	81	83
0090	81	83
MODEL YCUL	**C**	**D**
0076	200	294
0080	200	294
0086	173	294
0090	254	365

LD08735

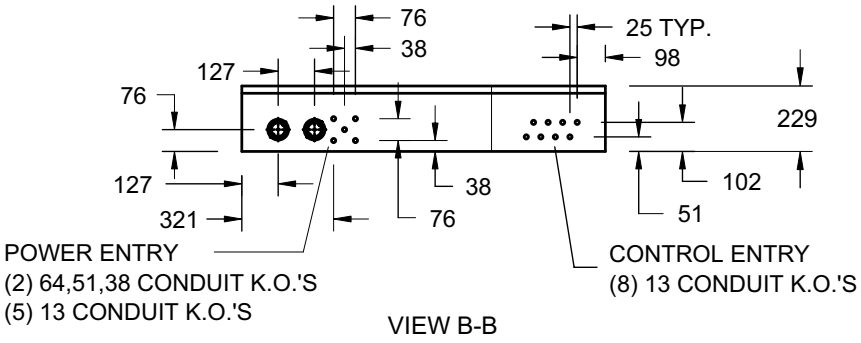
ALUMINUM COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0076	1454	1165	1149
0080	1457	1154	1146
0086	1457	1163	1144
0090	1457	1154	1141

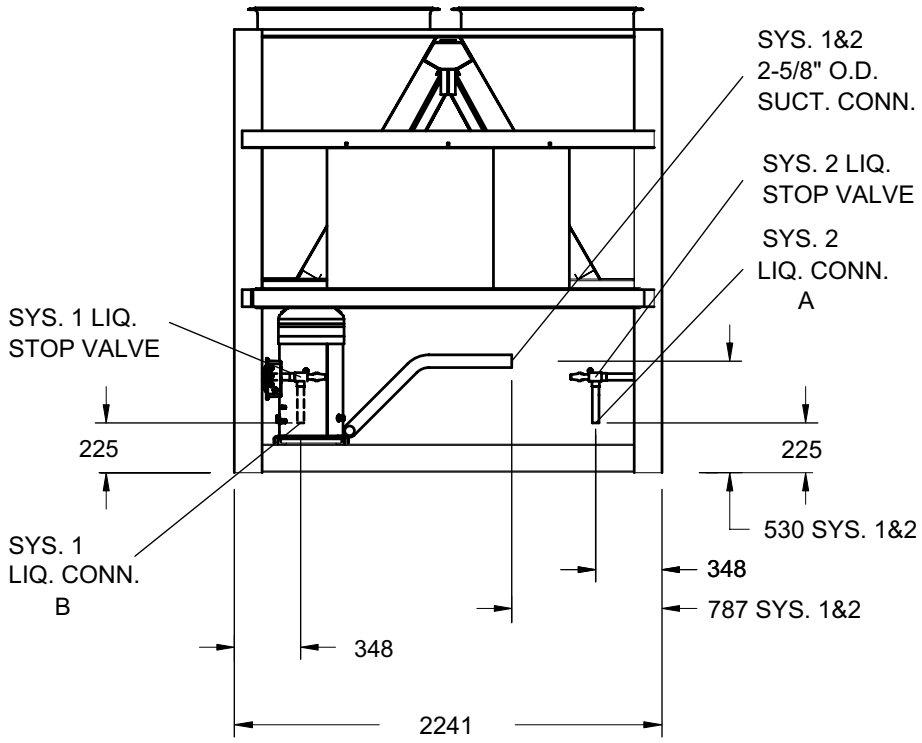
COPPER COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0076	1464	1164	1172
0080	1469	1154	1175
0086	1469	1162	1172
0090	1469	1154	1169

DIMENSIONS - YCUL0096 - YCUL0100 (SI)



VIEW B-B



VIEW A-A

MODEL YCUL	A	B
0096	1 3/8" OD	1 1/8" OD
0100	1 3/8" OD	1 3/8" OD

LD08720

NOTE:

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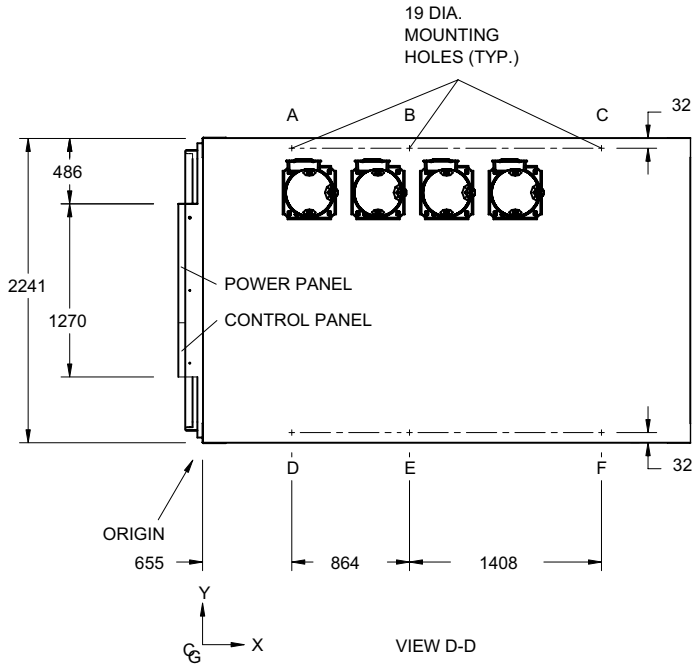
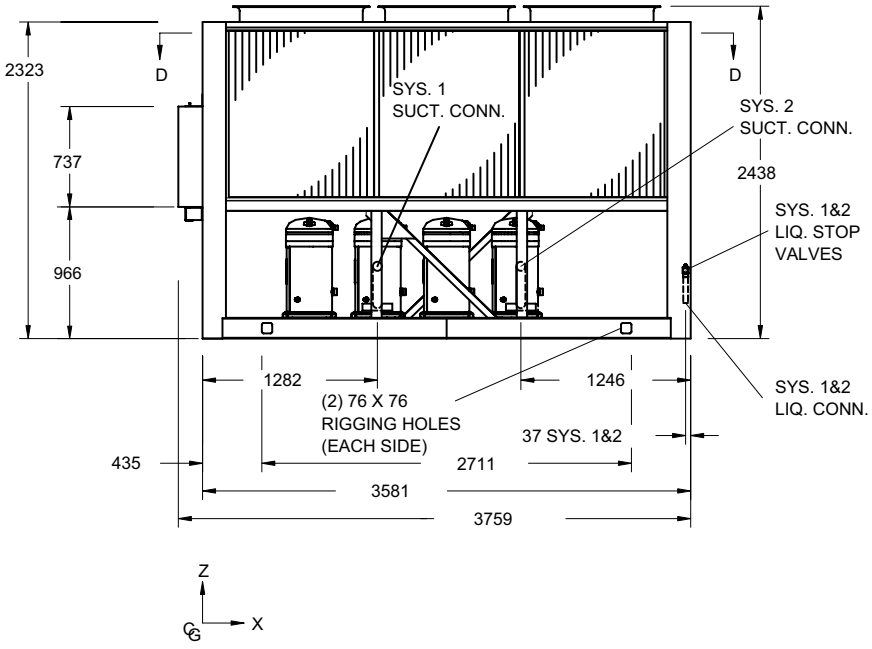




LD08721

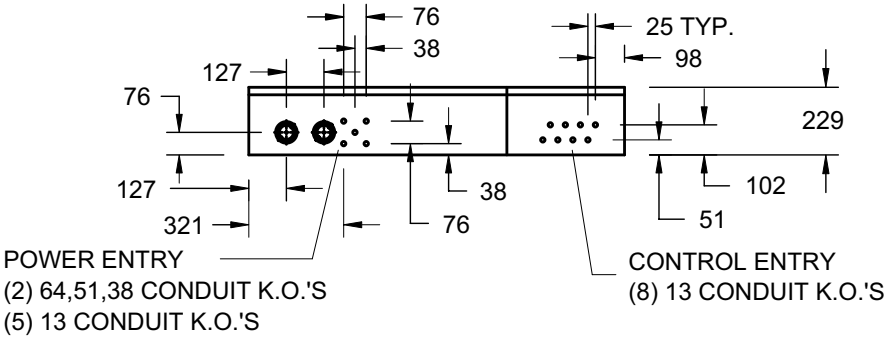
ALUMINUM COIL

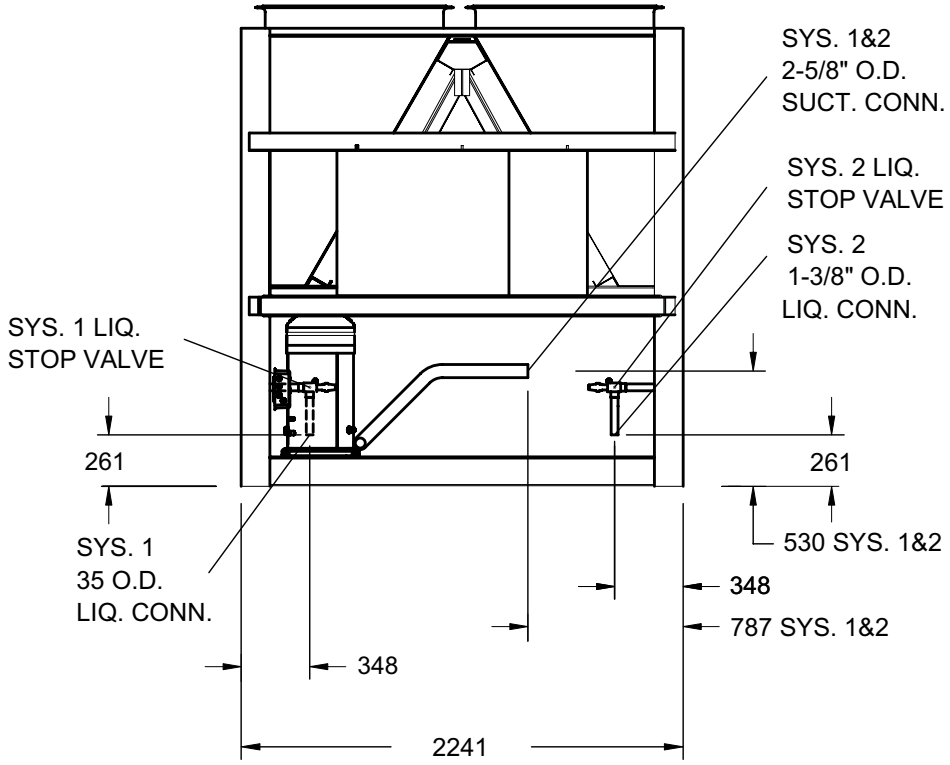
YCUL	Center of Gravity (mm)		
	X	Y	Z
0096	1626	1293	1229
0100	1648	1293	1222

COPPER COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0096	1646	1271	1282
0100	1667	1271	1274

DIMENSIONS - YCUL0106 (SI)



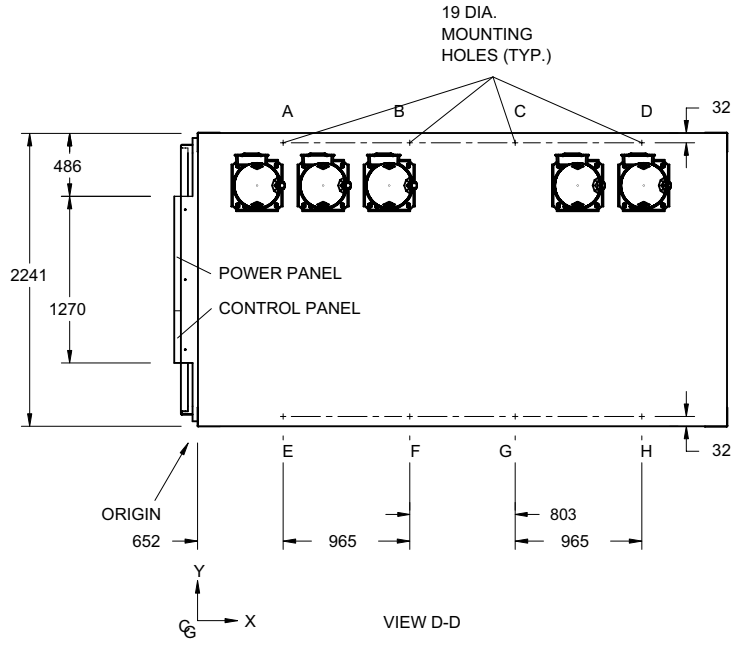


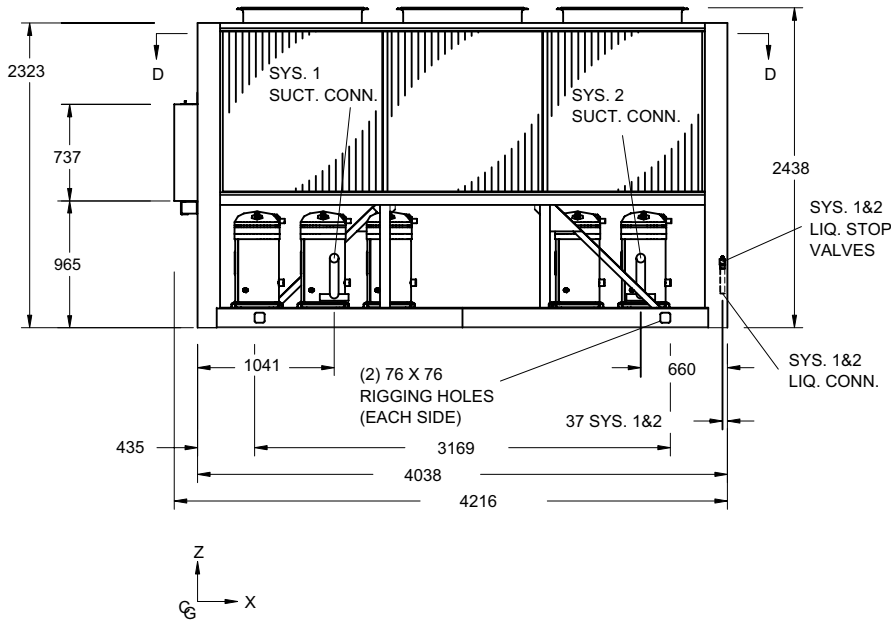
VIEW A-A

LD08722

NOTE:

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable airflow patterns and possible diminished performance. YORK's unit controls will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall – 2m; rear to wall – 2m; control panel to end wall – 1.2m; top – no obstructions allowed; distance between adjacent units – 3m. No more than one adjacent wall may be higher than the unit.





LD08723

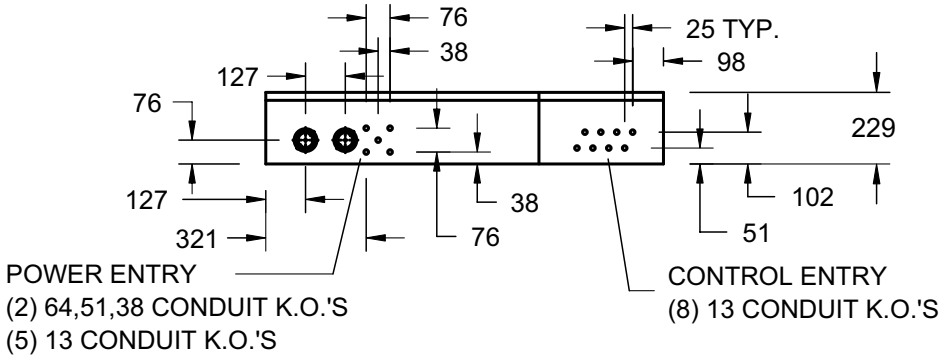
ALUMINUM COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0106	1877	1814	1186

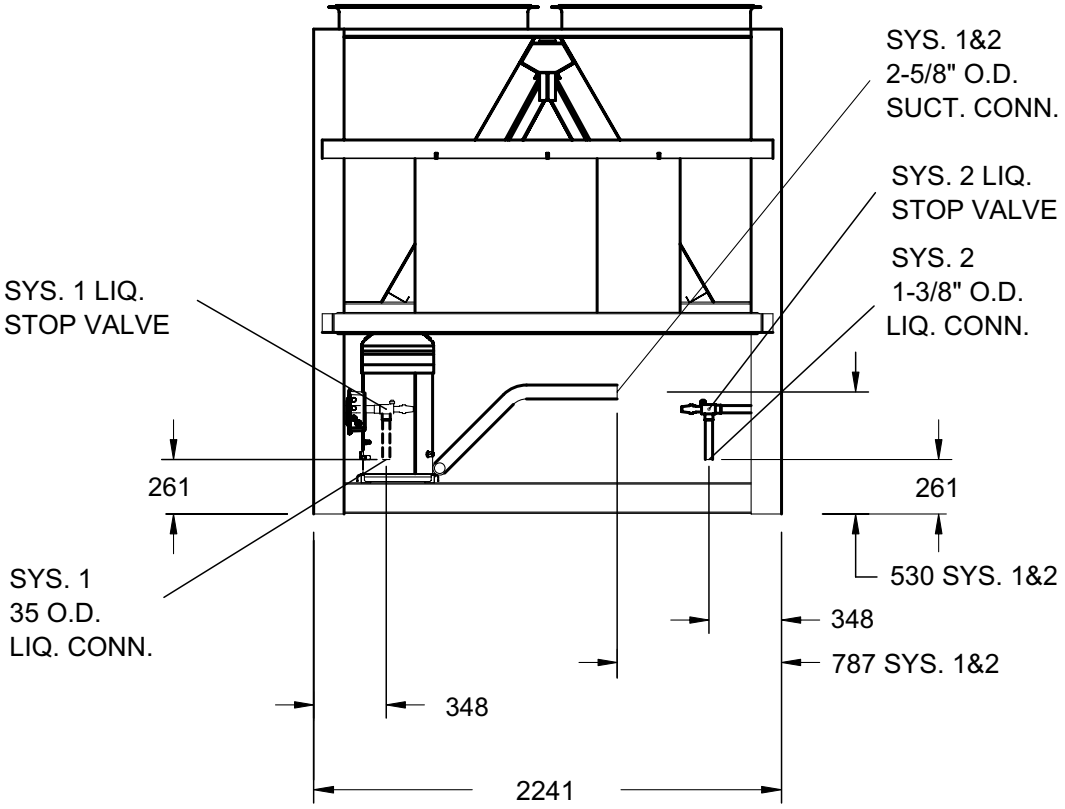
COPPER COIL

YCUL	Center of Gravity (mm)		
	X	Y	Z
0106	1895	1281	1221

DIMENSIONS - YCUL0120 - YCUL0140 (SI)



VIEW B-B



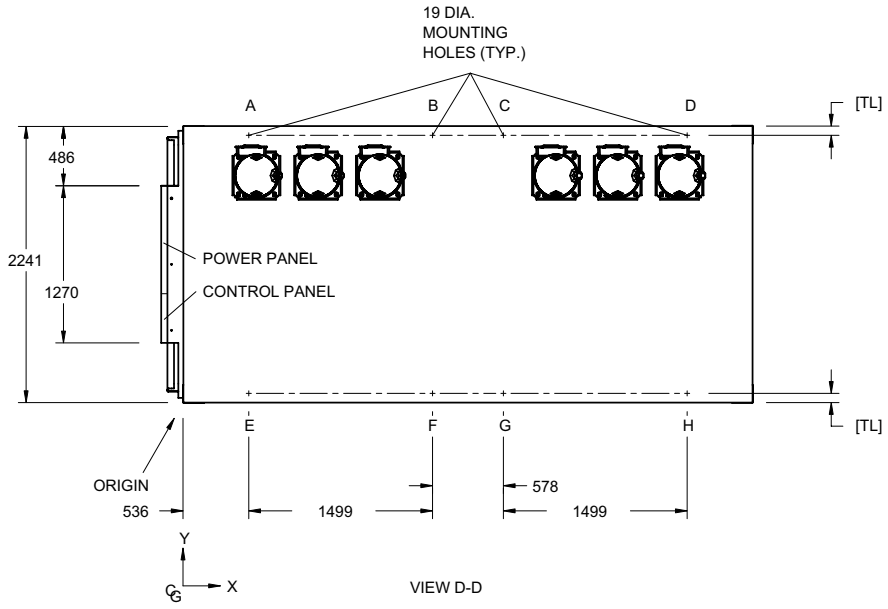
VIEW A-A

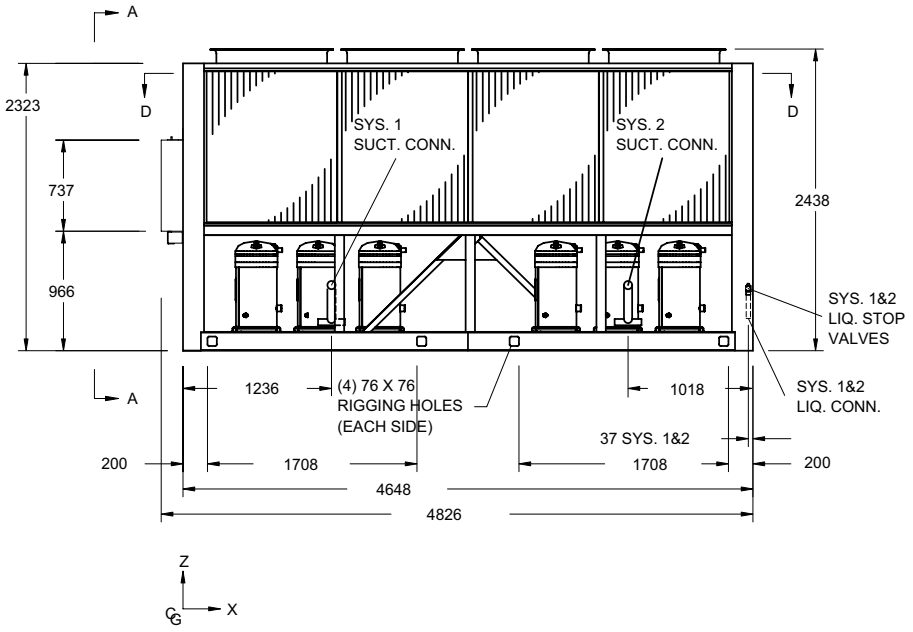
LD08724

NOTE:

Placement on a level surface of free of obstructions (including snow, for winter operation) or air circulation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable airflow patterns and possible diminished performance. YORK's unit controls will optimize operation without nuisance high-pressure safety cutouts; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall – 2m; rear to wall – 2m; control panel to end wall – 1.2m; top – no obstructions allowed; distance between adjacent units – 3m. No more than one adjacent wall may be higher than the unit.

DIMENSIONS - YCUL0120 - YCUL0140 (METRIC)





LD08725

ALUMINUM

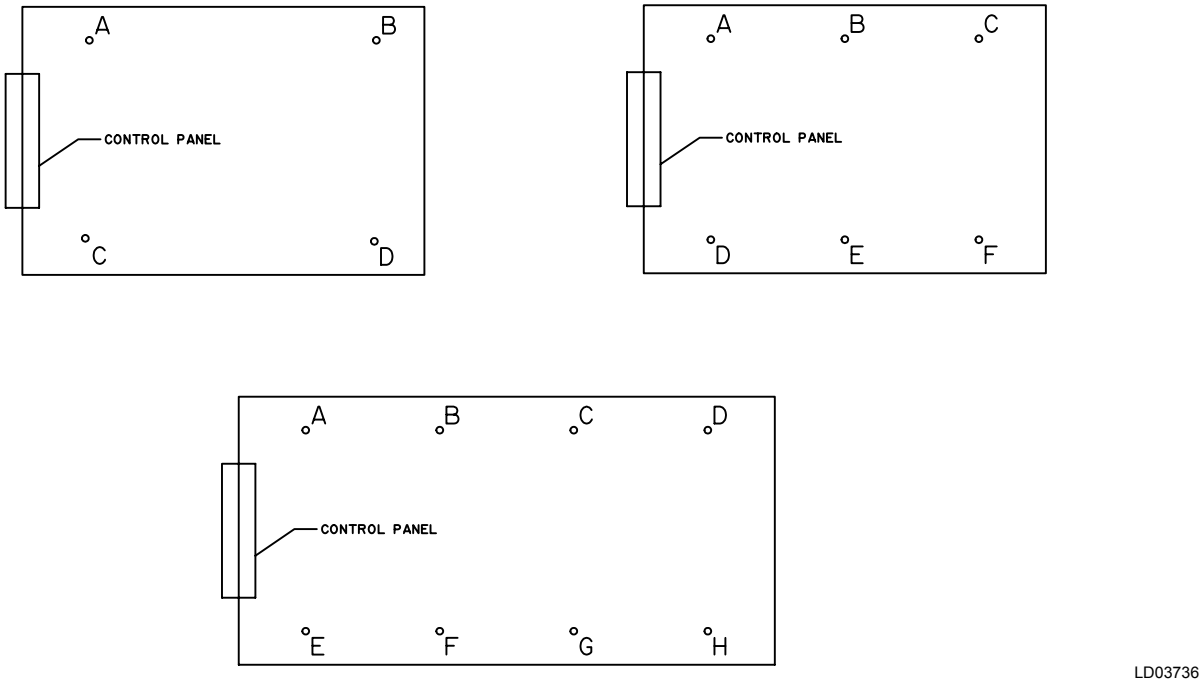
YCUL	Center of Gravity (mm)		
	X	Y	Z
0120	2199	1302	1264
0130	2160	1321	1238
0140	2180	1334	1215

COPPER

YCUL	Center of Gravity (mm)		
	X	Y	Z
0120	2116	1276	1291
0130	2183	1293	1267
0140	2199	1306	1246

WEIGHT DISTRIBUTION

ALUMINUM FIN AND BLACK FIN COILS



LD03736

English Units

YCUL	Aluminum Fin and Black Fin Coil Weight Distribution (lbs)								
	A	B	C	D	E	F	G	H	Total
0016	577	469	554	450	---	---	---	---	2051
0026	579	470	557	452	---	---	---	---	2058
0030	697	534	662	507	---	---	---	---	2401
0036	678	586	634	548	---	---	---	---	2445
0040	801	693	694	600	---	---	---	---	2788
0046	987	984	990	987	---	---	---	---	3947
0050	1005	1005	995	995	---	---	---	---	4000
0056	1012	1013	1015	1017	---	---	---	---	4057
0060	1031	1034	1023	1026	---	---	---	---	4114
0066	1039	1045	1042	1049	---	---	---	---	4175
0076	1275	1165	1256	1147	---	---	---	---	4842
0080	1304	1196	1306	1198	---	---	---	---	5004
0086	1351	1240	1334	1225	---	---	---	---	5150
0090	1365	1253	1367	1255	---	---	---	---	5240
0096	1142	1073	971	856	782	708	---	---	5532
0100	1157	1089	1022	842	793	743	---	---	5646
0106	1102	987	871	755	785	703	621	538	6362
0120	1274	1174	1074	975	913	842	770	699	7720
0130	1389	1252	1115	997	961	866	771	676	8008
0140	1445	1317	1189	1062	975	889	803	717	8396

SI Units

YCUL	Aluminum Fin and Black Fin Coil Weight Distribution (kg)								
	A	B	C	D	E	F	G	H	Total
0016	262	213	251	204	---	---	---	---	930
0026	263	213	253	205	---	---	---	---	933
0030	316	242	300	230	---	---	---	---	1089
0036	307	266	288	249	---	---	---	---	1109
0040	364	314	315	272	---	---	---	---	1265
0046	448	446	449	448	---	---	---	---	1791
0050	456	456	452	451	---	---	---	---	1814
0056	459	460	460	461	---	---	---	---	1840
0060	467	469	464	466	---	---	---	---	1866
0066	471	474	473	476	---	---	---	---	1894
0076	578	528	570	520	---	---	---	---	2196
0080	591	542	593	543	---	---	---	---	2270
0086	613	562	605	556	---	---	---	---	2336
0090	619	568	620	569	---	---	---	---	2377
0096	518	487	440	388	355	321	---	---	2509
0100	525	494	464	382	360	337	---	---	2561
0106	500	448	395	342	356	319	282	244	2886
0120	578	533	487	442	414	382	349	317	3502
0130	630	568	506	443	436	393	350	307	3632
0140	655	597	539	482	442	403	364	325	3808

WEIGHT DISTRIBUTION

COPPER FIN COILS

English Units

YCUL	Copper Fin Coil Weight Distribution (lbs)								
	A	B	C	D	E	F	G	H	Total
0016	614	470	633	484	---	---	---	---	2201
0026	616	470	636	486	---	---	---	---	2208
0030	733	535	742	541	---	---	---	---	2551
0036	714	586	711	584	---	---	---	---	2595
0040	839	693	770	636	---	---	---	---	2938
0046	1055	1065	1058	1069	---	---	---	---	4247
0050	1073	1086	1064	1077	---	---	---	---	4300
0056	1080	1095	1083	1099	---	---	---	---	4357
0060	1098	1116	1091	1109	---	---	---	---	4414
0066	1107	1127	1110	1131	---	---	---	---	4475
0076	1343	1246	1324	1229	---	---	---	---	5142
0080	1390	1299	1393	1302	---	---	---	---	5384
0086	1437	1344	1421	1329	---	---	---	---	5530
0090	1451	1356	1454	1359	---	---	---	---	5620
0096	1293	1211	1130	982	920	858	---	---	6394
0100	1275	1227	1180	967	931	894	---	---	6474
0106	1216	1103	990	877	906	822	738	653	7305
0120	1348	1319	1289	1260	1019	997	975	952	9160
0130	1461	1396	1331	1265	1070	1023	975	927	9448
0140	1561	1461	1405	1305	1085	1046	1006	967	9836

SI Units

	Copper Fin Coil Weight Distribution (kg)								
YCUL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Total**
0016	279	213	287	220	---	---	---	---	998
0026	279	213	288	220	---	---	---	---	1001
0030	333	243	336	245	---	---	---	---	1157
0036	324	266	322	265	---	---	---	---	1177
0040	380	314	349	289	---	---	---	---	1333
0046	478	483	480	485	---	---	---	---	1927
0050	487	493	482	488	---	---	---	---	1950
0056	490	497	491	498	---	---	---	---	1976
0060	498	506	495	503	---	---	---	---	2002
0066	502	511	504	513	---	---	---	---	2030
0076	609	565	600	557	---	---	---	---	2332
0080	630	589	632	591	---	---	---	---	2442
0086	652	609	645	603	---	---	---	---	2508
0090	658	615	659	617	---	---	---	---	2549
0096	586	549	513	445	417	389	---	---	2900
0100	578	557	535	439	422	406	---	---	2937
0106	552	500	449	398	411	373	335	296	3313
0120	612	598	585	571	462	452	442	432	4155
0130	663	633	604	574	486	464	442	421	4286
0140	688	663	638	612	492	474	456	438	4462

ISOLATOR SELECTIONS

ALUMINUM FIN AND BLACK FIN COILS

1” DEFLECTION ISOLATOR SELECTION - VMC TYPE

YCUL	A	B	C	D	E	F	G	H
0016	CP-1-26	CP-1-26	CP-1-26	CP-1-26	---	---	---	---
0026	CP-1-26	CP-1-26	CP-1-26	CP-1-26	---	---	---	---
0030	CP-1-27	CP-1-26	CP-1-27	CP-1-26	---	---	---	---
0036	CP-1-27	CP-1-26	CP-1-27	CP-1-26	---	---	---	---
0040	CP-1-28	CP-1-27	CP-1-27	CP-1-26	---	---	---	---
0046	CP-1-31	CP-1-31	CP-1-31	CP-1-31	---	---	---	---
0050	CP-1-31	CP-1-31	CP-1-31	CP-1-31	---	---	---	---
0056	CP-1-31	CP-1-31	CP-1-31	CP-1-31	---	---	---	---
0060	CP-1-31	CP-1-31	CP-1-31	CP-1-31	---	---	---	---
0066	CP-1-31	CP-1-31	CP-1-31	CP-1-31	---	---	---	---
0076	CP-2-27	CP-2-26	CP-2-27	CP-2-26	---	---	---	---
0080	CP-2-27	CP-2-26	CP-2-27	CP-2-26	---	---	---	---
0086	CP-2-27	CP-2-27	CP-2-27	CP-2-27	---	---	---	---
0090	CP-2-27	CP-2-27	CP-2-27	CP-2-27	---	---	---	---
0096	CP-2-26	CP-2-26	CP-2-26	CP-2-25	CP-2-25	CP-2-25	---	---
0100	CP-2-26	CP-2-26	CP-2-26	CP-2-25	CP-2-25	CP-2-25	---	---
0106	CP-2-26	CP-2-26	CP-2-25	CP-2-25	CP-2-25	CP-2-25	CP-2-25	CP-2-25
0120	CP-2-27	CP-2-27	CP-2-26	CP-2-26	CP-2-26	CP-2-25	CP-2-25	CP-2-25
0130	CP-2-27	CP-2-27	CP-2-26	CP-2-26	CP-2-26	CP-2-25	CP-2-25	CP-2-25
0140	CP-2-27	CP-2-27	CP-2-26	CP-2-26	CP-2-26	CP-2-25	CP-2-25	CP-2-25

SEISMIC ISOLATOR SELECTION - VMC TYPE

SEISMIC ISOLATOR SELECTION - VMC TYPE

YCUL	A	B	C	D	E	F	G	H
0016	AEQM-96	AEQM-96	AEQM-96	AEQM-96	---	---	---	---
0026	AEQM-96	AEQM-96	AEQM-96	AEQM-96	---	---	---	---
0030	AEQM-97	AEQM-96	AEQM-97	AEQM-96	---	---	---	---
0036	AEQM-97	AEQM-96	AEQM-97	AEQM-96	---	---	---	---
0040	AEQM-98	AEQM-97	AEQM-97	AEQM-96	---	---	---	---
0046	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	---	---	---	---
0050	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	---	---	---	---
0056	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	---	---	---	---
0060	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	---	---	---	---
0066	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	---	---	---	---
0076	AEQM-1300	AEQM-1000	AEQM-1300	AEQM-1000	---	---	---	---
0080	AEQM-1300	AEQM-1000	AEQM-1300	AEQM-1000	---	---	---	---
0086	AEQM-1600	AEQM-1300	AEQM-1600	AEQM-1300	---	---	---	---
0090	AEQM-1600	AEQM-1300	AEQM-1600	AEQM-1300	---	---	---	---
0096	AEQM-1300	AEQM-1300	AEQM-1300	AEQM-1000	AEQM-1000	AEQM-1000	---	---
0100	AEQM-1300	AEQM-1300	AEQM-1300	AEQM-1000	AEQM-1000	AEQM-1000	---	---
0106	AEQM-1300	AEQM-1300	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000
0120	AEQM-1600	AEQM-1600	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000
0130	AEQM-1600	AEQM-1600	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000
0140	AEQM-1600	AEQM-1600	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000

ISOLATOR SELECTIONS CON'T

ALUMINUM FIN AND BLACK FIN COILS

1" DEFLECTION ISOLATOR SELECTION - VMC TYPE

NEOPRENE ISOLATOR SELECTION - VMC TYPE RD

YCUL	A	B	C	D	E	F	G	H
0016	-3 Grn	-3 Red	-3 Grn	-3 Red	---	---	---	---
0026	-3 Grn	-3 Red	-3 Grn	-3 Red	---	---	---	---
0030	-3 Grn	-3 Grn	-3 Grn	-3 Red	---	---	---	---
0036	-3 Grn	-3 Grn	-3 Grn	-3 Red	---	---	---	---
0040	-3 Gray	-3 Gray	-3 Gray	-3 Grn	---	---	---	---
0046	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0050	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0056	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0060	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0066	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0076	-4 Blk	-4 Blk	-4 Blk	-4 Blk	---	---	---	---
0080	-4 Blk	-4 Blk	-4 Blk	-4 Blk	---	---	---	---
0086	-4 Blk	-4 Blk	-4 Blk-4 Blk	-4 Blk	---	---	---	---
0090	-4 Blk	-4 Blk	-4 Blk	-4 Blk	---	---	---	---
0096	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray	-3 Grn	---	---
0100	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray	-3 Grn	---	---
0106	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray	-3 Grn	-3 Grn	-3 Gray
0120	-4 Blk	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray	-3 Grn
0130	-4 Blk	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray	-3 Grn
0140	-4 Blk	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray	-3 Grn

ISOLATOR SELECTIONS

COPPER FIN COILS

1" DEFLECTION ISOLATOR SELECTION - VMC TYPE

Model YCUL	A	B	C	D	E	F	G	H
0016	CP-1-27	CP-1-26	CP-1-27	CP-1-26	—-	—-	—-	—-
0026	CP-1-27	CP-1-26	CP-1-27	CP-1-26	—-	—-	—-	—-
0030	CP-1-27	CP-1-26	CP-1-27	CP-1-26	—-	—-	—-	—-
0036	CP-1-27	CP-1-26	CP-1-27	CP-1-26	—-	—-	—-	—-
0040	CP-1-28	CP-1-27	CP-1-28	CP-1-27	—-	—-	—-	—-
0046	CP-1-31	CP-1-31	CP-1-31	CP-1-31	—-	—-	—-	—-
0050	CP-1-31	CP-1-31	CP-1-31	CP-1-31	—-	—-	—-	—-
0056	CP-1-31	CP-1-31	CP-1-31	CP-1-31	—-	—-	—-	—-
0060	CP-2-26	CP-2-26	CP-2-26	CP-2-26	—-	—-	—-	—-
0066	CP-2-26	CP-2-26	CP-2-26	CP-2-26	—-	—-	—-	—-
0076	CP-2-27	CP-2-27	CP-2-27	CP-2-27	—-	—-	—-	—-
0080	CP-2-27	CP-2-27	CP-2-27	CP-2-27	—-	—-	—-	—-
0086	CP-2-27	CP-2-27	CP-2-27	CP-2-27	—-	—-	—-	—-
0090	CP-2-27	CP-2-27	CP-2-27	CP-2-27	—-	—-	—-	—-
0096	CP-2-27	CP-2-27	CP-2-26	CP-2-26	CP-2-26	CP-2-25	—-	—-
0100	CP-2-27	CP-2-27	CP-2-26	CP-2-26	CP-2-26	CP-2-25	—-	—-
0106	CP-2-27	CP-2-26	CP-2-26	CP-2-25	CP-2-26	CP-2-25	CP-2-25	CP-2-25
0120	CP-2-28	CP-2-27	CP-2-27	CP-2-27	CP-2-26	CP-2-26	CP-2-26	CP-2-26
0130	CP-2-28	CP-2-27	CP-2-27	CP-2-27	CP-2-26	CP-2-26	CP-2-26	CP-2-26
0140	CP-2-28	CP-2-27	CP-2-27	CP-2-27	CP-2-26	CP-2-26	CP-2-26	CP-2-26

SEISMIC ISOLATOR SELECTION - VMC TYPE

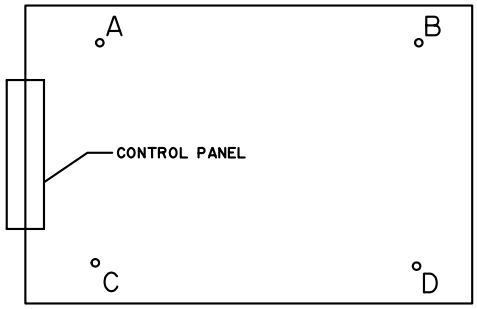
Model YCUL	A	B	C	D	E	F	G	H
0016	AEQM-97	AEQM-96	AEQM-97	AEQM-96	—-	—-	—-	—-
0026	AEQM-97	AEQM-96	AEQM-97	AEQM-96	—-	—-	—-	—-
0030	AEQM-97	AEQM-96	AEQM-97	AEQM-96	—-	—-	—-	—-
0036	AEQM-97	AEQM-96	AEQM-97	AEQM-96	—-	—-	—-	—-
0040	AEQM-98	AEQM-97	AEQM-98	AEQM-97	—-	—-	—-	—-
0046	AEQM-99	AEQM-99	AEQM-1600	AEQM-1600	—-	—-	—-	—-
0050	AEQM-99	AEQM-99	AEQM-99	AEQM-99	—-	—-	—-	—-
0056	AEQM-99	AEQM-99	AEQM-999	AEQM-99	—-	—-	—-	—-
0060	AEQM-99	AEQM-99	AEQM-99	AEQM-99	—-	—-	—-	—-
0066	AEQM-99	AEQM-99	AEQM-99	AEQM-99	—-	—-	—-	—-
0076	AEQM-1600	AEQM-1300	AEQM-1600	AEQM-1300	—-	—-	—-	—-
0080	AEQM-1600	AEQM-1300	AEQM-1600	AEQM-1300	—-	—-	—-	—-
0086	AEQM-1600	AEQM-1600	AEQM-1600	AEQM-1600	—-	—-	—-	—-
0090	AEQM-1600	AEQM-1600	AEQM-1600	AEQM-1600	—-	—-	—-	—-
0096	AEQM-1600	AEQM-1300	AEQM-1300	AEQM-1300	AEQM-1000	AEQM-1000	—-	—-
0100	AEQM-1600	AEQM-1300	AEQM-1300	AEQM-1300	AEQM-1000	AEQM-1000	—-	—-
0106	AEQM-1600	AEQM-1300	AEQM-1300	AEQM-1000	AEQM-1300	AEQM-1000	AEQM-1000	AEQM-1000
0120	AEQM-1600	AEQM-1600	AEQM-1600	AEQM-1600	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000
0130	AEQM-1600	AEQM-1600	AEQM-1600	AEQM-1600	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000
0140	AEQM-1600	AEQM-1600	AEQM-1600	AEQM-1600	AEQM-1000	AEQM-1000	AEQM-1000	AEQM-1000

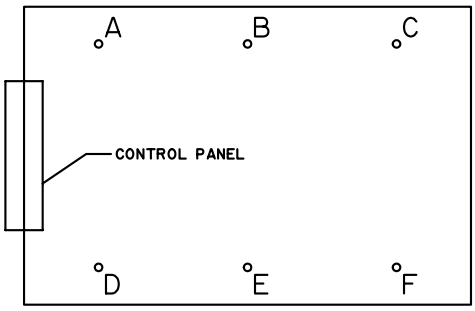
ISOLATOR SELECTIONS CON'T

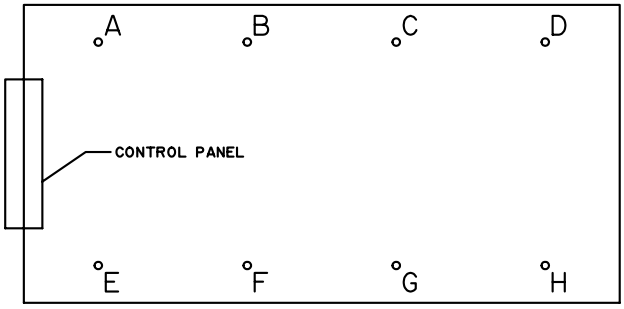
COPPER FIN COILS

1" DEFLECTION ISOLATOR SELECTION - VMC TYPE

Copper Fin, Neoprene Mount Selections								
YCUL	VMC Type RD							
	A	B	C	D	E	F	G	H
0016	-3 Grn	-3 Red	-3 Gn	-3 Red	---	---	---	---
0026	-3 Grn	-3 Red	-3 Grn	-3 Red	---	---	---	---
0030	-3 Grn	-3 Red	-3 Grn	-3 Red	---	---	---	---
0036	-3 Grn	-3 Grn	-3 Grn	-3 Grn	---	---	---	---
0040	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0046	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0050	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0056	-3 Gray	-3 Gray	-3 Gray	-3 Gray	---	---	---	---
0060	-4 Blk	-4 Blk	-4 Blk	-4 Blk	---	---	---	---
0066	-4 Blk	-4 Blk	-4 Blk	-4 Blk	---	---	---	---
0076	-4 Blk	-4 Blk	-4 Blk	-4 Blk	---	---	---	---
0080	-4 Blk	-4 Blk	-4 Blk	-4 Blk	---	---	---	---
0086	-4 Blk	-4 Blk	--4 Blk	-4 Blk	---	---	---	---
0090	--4 Blk	-4 Blk	-4 Blk	-4 Blk	---	---	---	---
0096	-4 Blk	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	---	---
0100	-4 Blk	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	---	---
0106	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray	-3 Grn	-3 Grn
0120	-4 Red	-4 Blk	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray
0130	-4 Red	-4 Blk	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray
0140	-4 Red	-4 Blk	-4 Blk	-4 Blk	-3 Gray	-3 Gray	-3 Gray	-3 Gray







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DIMENSIONS

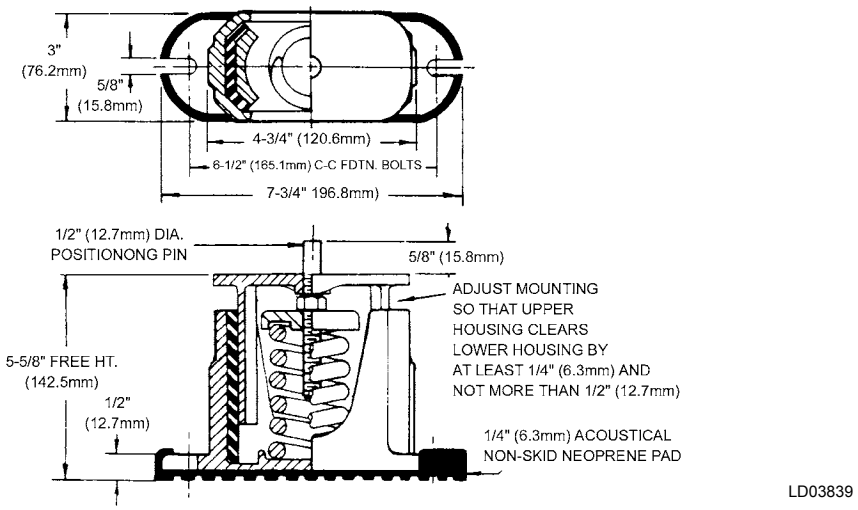


FIG. 11 – TYPE CP 1

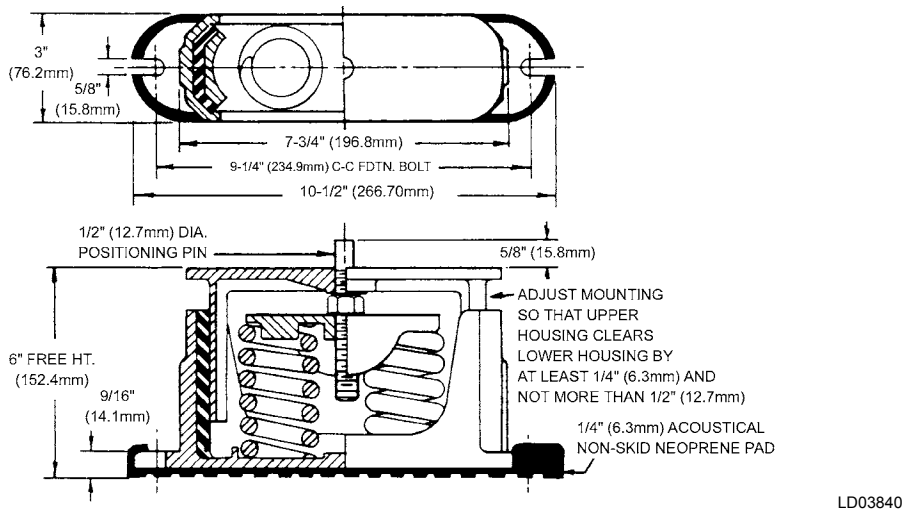


FIG. 12 – TYPE CP 2

ISOLATOR SPRING IDENTIFICATION TABLE

1" DEFLECTION			SEISMIC		
MODEL	**PART- #**	**COLOR**	**MODEL**	**PART #**	**COLOR**
CP-1-26	308439-26	PURPLE	**AEQM-95**	301055-95	RED
CP-1-27	308439-27	ORANGE	**AEQM-97**	301055-97	WHITE
CP-1-28	308439-28	GREEN	**AEQM-98**	301055-98	GRAY
CP-1-31	308439-31	GRAY	**AEQM-96**	301055-96	BLACK
CP-2-25	308439-25	RED	**AEQM-1000**	30106-1000	GREEN
CP-2-26	308692-26	PURPLE	**AEQM-1300**	30106-1300	YELLOW
CP-2-27	308962-27	ORANGE	**AEQM-1600**	301060-1600	GRAY
CP-2-28	308692-28	GREEN	**AEQM-1625**	301060-1625	RED
CP-2-31	308692-31	GRAY	**AEQM-1628**	301060-1628	GRAY/GREEN

INSTALLATION AND ADJUSTING INSTALLATIONS
TYPE CP MOUNTING

Mountings are shipped completely assembled, ready to install.

1. Locate mountings under equipment at positions shown on tags or on VM layout drawings, or as indicated on packing slip or correspondence.
2. Set mountings on subbase, shimming or grouting where required to provide flat and level surface at the same elevation for all mountings (1/4" maximum difference in elevation can be tolerated). Support the full underside of the base plate – do not straddle gaps or small shims.
3. Unless specified, mountings need not be fastened to floor in any way. If required, bolt mountings to floor through slots.
4. Set the machine or base on the mountings. The weight of the machine will cause the upper housing of the mount to go down, possibly resting on the lower housing.
5. If clearance "X" is less than 1/4" on any mounting, with wrench turn up one complete turn *on* the adjusting bolt of each mounting. Repeat this procedure until 1/4", clearance at "X" is obtained on one or more mountings.
6. Take additional turns on all mountings having less than 1/4" clearance, until all mountings have at least this clearance.
7. Level the machine by taking additional turns on all mounts at the low side. Clearance should not exceed 1/2" - greater clearance indicates that mountings were not all installed at the same elevation, and shims are required. This completes adjustment.

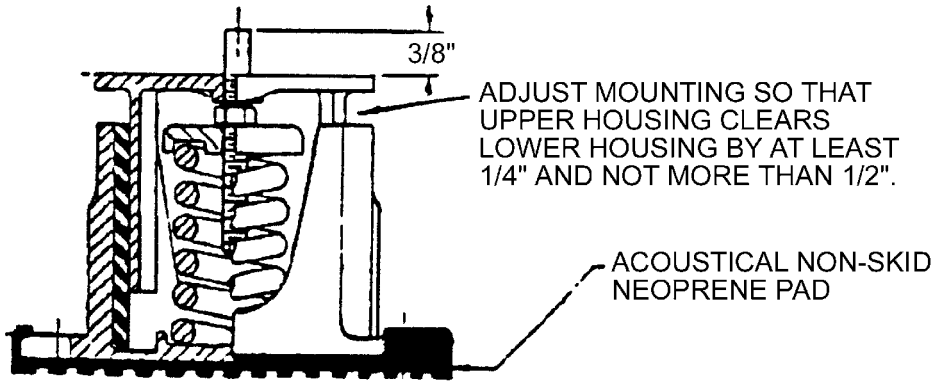


FIG. 13 – TYPE CP MOUNTING

DIMENSIONS

MODEL #	A	B	C	D	E	F	G	H	J
AEQM-97	7	5-1/2	4-1/2	2-1/2	5/8	1/4	7-1/4	5/8	3/8
AEQM-98	7	5-1/2	4-1/2	2-1/2	5/8	1/4	7-1/4	5/8	3/8
AEQM-99	7	5-1/2	4-1/2	2-1/2	5/8	1/4	7-1/4	5/8	3/8
AEQM-1000	8-1/2	6-1/2	6	4-1/2	3/4	3/8	8-3/8	7/8	1/2
AEQM-1300	8-1/2	6-1/2	6	4-1/2	3/4	3/8	8-3/8	7/8	1/2
AEQM-1600	8-1/2	6-1/2	6	4-1/2	3/4	3/8	8-3/8	7/8	1/2
AEQM-1625	8-1/2	6-1/2	6	4-1/2	3/4	3/8	8-3/8	7/8	1/2
AEQM-1628	8-1/2	6-1/2	6	4-1/2	3/4	3/8	8-3/8	7/8	1/2

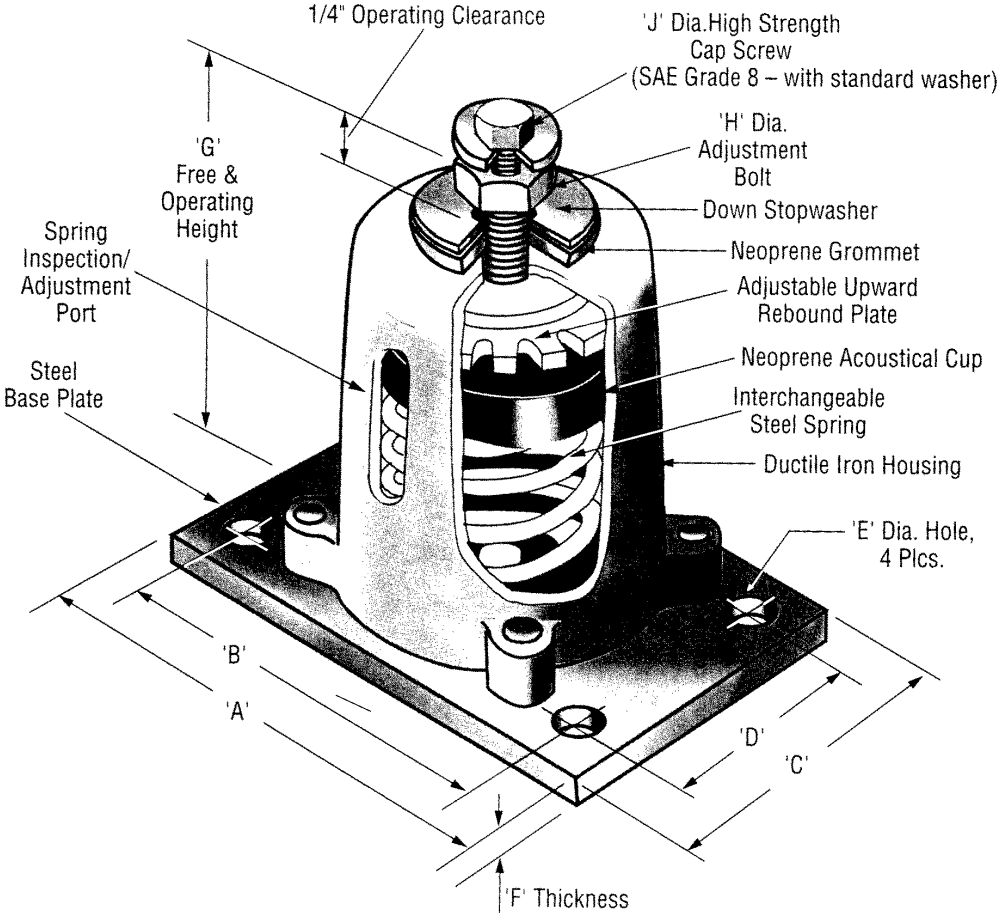


FIG. 14 – R SPRING SEISMIC ISOLATOR

"AEQM" SPRING-FLEX MOUNTING INSTALLATION AND ADJUSTMENT INSTRUCTIONS

1. Isolators are shipped fully assembled and are to be spaced and located in accordance with installation drawings or as otherwise recommended.

   1a. Locate spring port facing outward from equipment or base so that spring is visible.

2. To facilitate installation, prior to installing, VMC recommends turning adjusting bolt "B" so that the "Operating Clearance" marked "*" is approximately 1" to 1-1/2" for 1" deflection units, 1-1/2" to 2" for 1-1/2" deflection units, and 2" to 2-1/2" for 2" deflection units.

3. Locate isolators on floor or subbase as required, ensuring that the isolator centerline matches the equipment or equipment base mounting holes. Shim and/or grout as required to level all isolator base plates "A". A 1/4" maximum difference in elevation can be tolerated.

4. Anchor all isolators to floor or subbase as required. For installing on concrete VMC recommends HILTI type HSL heavy duty anchors or equal.

5. Remove cap screw "C" and save. Gently place machine or machine base on top of bolt "B". Install cap screw "C" but **DO NOT** tighten.

6. The weight of the machine will cause the spring and thus bolt "B" to descend.

7. Adjust all isolators by turning bolt "B" so that the operating clearance "*" is approximately 1/4". NOTE: It may be necessary to adjust rebound plate "D" for clearance.

8. Check equipment level and fine adjust isolators to level equipment.

9. Adjust rebound plate "D" so that the operating clearance "**" is no more than 1/4".

10. Tighten cap screw "C". Adjustment is complete.

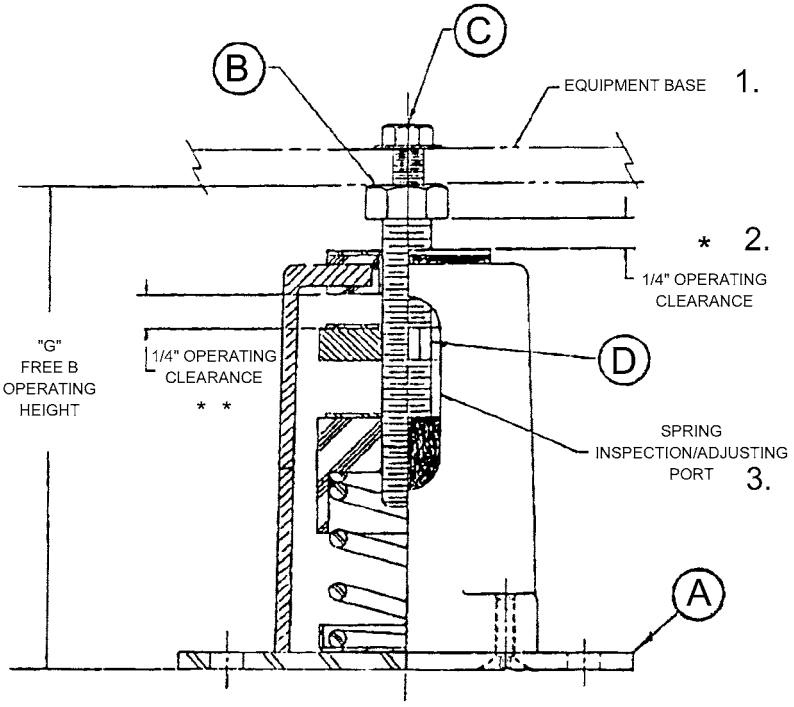


FIG. 15 – "AEQM" SPRING-FLEX MOUNTING

PRE-STARTUP CHECKLIST

JOB NAME: _____

SALES ORDER #: _____

LOCATION: _____

SOLD BY: _____

INSTALLING CONTRACTOR: _____

START-UP TECHNICIAN/ COMPANY: _____

START-UP DATE : _____

CHILLER MODEL #: _____

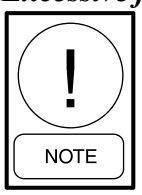
SERIAL #: _____

CHECKING THE SYSTEM PRIOR TO INITIAL START (NO POWER)

Unit Checks

- ❑ 1. Inspect the unit for shipping or installation damage.
- ❑ 2. Assure that all piping has been completed.
- ❑ 3. Visually check for refrigerant piping leaks.
- ❑ 4. Open suction line ball valve, discharge line ball valve, and liquid line valve for each system.
- ❑ 5. The compressor oil level should be maintained so that an oil level is visible in the sight glass. The oil level can only be tested when the compressor is running in stabilized conditions, guaranteeing that there is no liquid refrigerant in the lower shell of the compressor. In this case, the oil should be between 1/4 and 3/4 in the sight glass. At shutdown, the oil level can fall to the bottom limit of the oil sight glass.
- ❑ 6. Assure water pumps are on. Check and adjust water pump flow rate and pressure drop across the cooler (see LIMITATIONS). Verify flow switch operation.

Excessive flow may cause catastrophic damage to the evaporator.



- ❑ 7. Check the control panel to ensure it is free of foreign material (wires, metal chips, etc.).
- ❑ 8. Visually inspect wiring (power and control). Wiring MUST meet N.E.C. and local codes. See Figures 2- 5, pages 24 - 27.
- ❑ 9. Check tightness of power wiring inside the power panel on both sides of the motor contactors and overloads.
- ❑10. Check for proper size fuses in main and control circuits, and verify overload setting corresponds with RLA and FLA values in electrical tables.
- ❑11. Assure 120VAC Control Power to CTB2 has 15 amp minimum capacity. See Table 1, page 20.
- ❑12. Be certain all water temp sensors are inserted completely in their respective wells and are coated with heat conductive compound.
- ❑13. Assure that evaporator TXV bulbs or EEV bulbs are strapped onto the suction lines at 4 or 8 o'clock positions or suction temp. sensors if EEVs are installed.
- ❑14. Ensure oil level in the compressor or oil line sight glasses is between 1/4-3/4 glass.
- ❑15. Check the tightness of the heaters on each compressor. Tighten the heater if the heater fingers do not all touch the compressor housing. Inspect the heater around the entire perimeter of each compressor. The heater should be torqued to 26 in. lbs. ± 4 in. lbs. (3 N·m ± 0.5 N·m).

COMPRESSOR HEATERS (POWER ON – 24 HOURS PRIOR TO START)

- ❑ 1. Apply 120VAC and verify its value between terminals 5 and 2 of CTB2. The voltage should be 120VAC +/- 10%.

  Power must be applied 24 hours prior to start-up.

  Each heater should draw approximately 0.5-1A.

PANEL CHECKS (POWER ON – BOTH UNIT SWITCH OFF)

- ❑ 1. Apply 3-phase power and verify its value. Voltage imbalance should be no more than 2% of the average voltage.
- ❑ 2. Apply 120VAC and verify its value on the terminal block in the Power Panel. Make the measurement between terminals 5 and 2 of CTB2. The voltage should be 120VAC +/- 10%.
- ❑ 3. Program/verify the Cooling Setpoints, Program Setpoints, and unit Options. Record the values below (see sections on Setpoints and Unit Keys for programming instruction).

TABLE 16 – SETPOINTS ENTRY LIST

OPTIONS	
Display Language	
Sys 1 Switch	
Sys 2 Switch	
* Ambient Control	
Local/Remote Mode	
Control Mode	
Display Units	
* Lead/Lag Control	
* Fan Control	
Manual Override	
Current Feedback	
** Soft Start	
** Unit Type	
** Refrigerant Type	
** Expansion Valve Type	Must be in TXV Mode
SETPOINTS	
Discharge Air or Suction Pressure	
Range	
EMS-PWM Max. Setpoint	
PROGRAM	
Discharge Pressure Cutout	
* Suct. Pressure Cutout	
Low Amb. Temp. Cutout	
Anti-Recycle Time	
* Fan Control On Pressure	
* Fan Differential Off Pressure	
Total # of Compressors	
* Number of Fans/System	
* Unit/Sys Voltage	
Unit ID	
* Sys 1 Superheat Setpoint	
* Sys 2 Superheat Setpoint	

* NOT ON ALL MODELS
** VIEWABLE ONLY

❑ 4. Put the unit into Service Mode (as described under the Control Service and Troubleshooting section) and cycle each condenser fan to ensure proper ro tation.

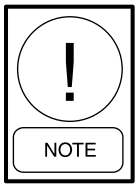
❑ 5. Prior to this step, turn system 2 off (if applicable –refer to Option 2 under "Unit Keys" section for more information on system switches.) Connect a manifold gauge to system 1 suction and discharge service valves.

Place the Unit Switch in the control panel to the ON position. **As each compressor cycles on, ensure that the discharge pressure rises and the suction pressure decreases.** If this does not occur, the compressor being tested is operating in the reverse direction and must be corrected. After verifying proper compressor rotation, turn the Unit Switch to "OFF."

This unit uses scroll compressors which can only operate in one direction. Failure to observe this will lead to compressor failure.

❑ 6. YCUL0046 - YCUL0130 units only – Turn system 1 off and system 2 on (refer to Option 2 under "UNIT KEYS" section for more information on system switches.)

Place the Unit Switch in the control panel to the ON position. **As each compressor cycles "on," ensure that the discharge pressure rises and the suction pressure decreases.** If this does not occur, the compressor being tested is operating in the reverse direction and must be corrected. After verifying proper compressor rotation, turn the Unit Switch to "OFF."



The Discharged Air or Suction Pressure setpoint may need to be temporarily lowered to ensure all compressors cycle "on."

❑ 7. After verifying compressor rotation, return the Unit Switch to the off position and ensure that both Systems are programmed for "ON" (refer to Option 2 under "Unit Keys" section for more information on system switches).

INITIAL START-UP

After the preceding checks have been completed and the control panel has been programmed as required in the pre-startup checklist, the chiller may be placed into operation.

❑ 1. Place the Unit Switch in the control panel to the ON position.

❑ 2. The first compressor will start and a flow of refrigerant will be noted in the sight glass. After several minutes of operation, the vapor in the sight glass will clear and there should be a solid column of liquid when the TXV stabilizes.

❑ 3. Allow the compressor to run a short time, being ready to stop it immediately if any unusual noise or adverse conditions develop.

❑ 4. Check the system operating parameters. Do this by selecting various displays such as pressures and temperatures and comparing these readings to pressures and temperatures taken with manifold gauges and temperature sensors.

❑ 5. With an ammeter, verify that each phase of the condenser fans and compressors are within the RLA as listed under Electrical Data.

CHECKING SUPERHEAT AND SUBCOOLING

The subcooling and superheat should always be checked when charging the system with refrigerant.

When the refrigerant charge is correct, there will be no vapor in the liquid sight glass with the system operating under full load conditions, and there will be 15°F (8.34°C) subcooled liquid leaving the condenser.

An overcharged system should be guarded against. The temperature of the liquid refrigerant out of the condenser should be no more than 18°F (10°C) subcooled at design conditions.

The subcooling temperature of each system can be calculated by recording the temperature of the liquid line at the outlet of the condenser and subtracting it from the liquid line saturation temperature at the liquid stop valve (liquid line saturation temp. is converted from a temperature/pressure chart).

Example:

Liquid line pressure =	102°F
202 PSIG converted to	- 87°F
minus liquid line temp.	
Subcooling =	15°F

The subcooling should be adjusted to 15°F at design conditions.

❑ 1. Record the liquid line pressure and its corresponding temperature, liquid line temperature and subcooling below:

	SYS 1	SYS 2	
Liq Line Press =	_____	_____	PSIG
Saturated Temp =	_____	_____	°F
Liq Line Temp =	_____	_____	°F
Subcooling =	_____	_____	°F

After the subcooling is verified, the suction superheat should be checked. The superheat should be checked only after steady state operation of the chiller has been established, the leaving water temperature has been pulled down to the required leaving water temperature, and the unit is running in a fully loaded condition. Correct superheat setting for a system is 10°F - 15°F (5.56°C - 8.33°C) 18" (46 cm) from the cooler.

Superheat should typically be set for no less than 10°F with only a single compressor running on a circuit. The superheat is calculated as the difference between the actual temperature of the returned refrigerant gas in the suction line entering the compressor and the temperature corresponding to the suction pressure as shown in a standard pressure/temperature chart.

Example:

Suction Temp =	46°F
minus Suction Press	
60 PSIG converted to Temp	- 34°F
Superheat =	12°F

When adjusting the expansion valve (TXV only), the adjusting screw should be turned not more than one turn at a time, allowing sufficient time (approximately 15 minutes) between adjustments for the system and the thermal expansion valve to respond and stabilize.

Assure that TXV superheat is set at a minimum of 10°F (5.56°C) with a single compressor running on each circuit.

❑ 2. Record the suction temperature, suction pressure, suction saturation temperature, and superheat of each system below:

	SYS 1	SYS 2	
Suction temp =	_____	_____	°F
Suction Pressure =	_____	_____	PSIG
Saturation Temp =	_____	_____	°F
Superheat =	_____	_____	°F

LEAK CHECKING

❑ 1. Leak check compressors, fittings, and piping to ensure no leaks.

If the unit is functioning satisfactorily during the initial operating period, no safeties trip and the compressors cycle to control water temperature to setpoint, the chiller is ready to be placed into operation.

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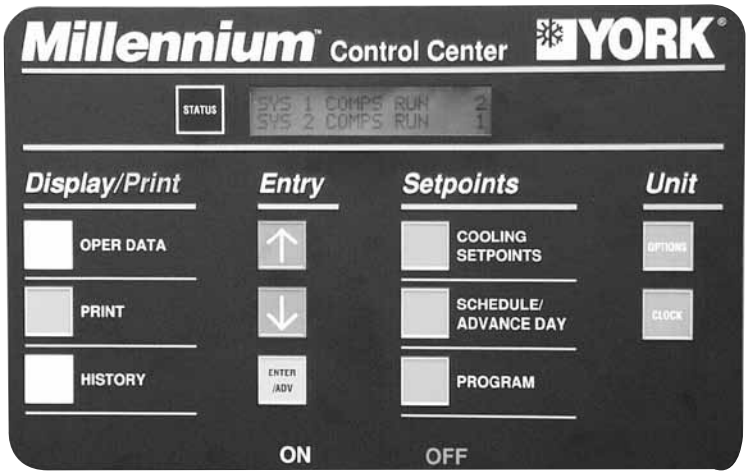
UNIT CONTROLS
YORK *MILLENNIUM* CONTROL CENTER



00065VIP

INTRODUCTION

The YORK MicroComputer Control Center is a microprocessor based control system designed to provide the entire control for the liquid chiller. The control logic embedded in the microprocessor based control system will provide control for the chilled liquid temperatures, as well as sequencing, system safeties, displaying status, and daily schedules. The MicroComputer Control Center consists of four basic components, 1) microprocessor board, 2) transformer, 3) display and 4) keypad. The keypad allows programming and accessing setpoints, pressures, temperatures, cutouts, daily schedule, options, and fault information.

Remote cycling, demand limiting and chilled liquid temperature reset can be accomplished by field supplied contacts.

Compressor starting/stopping and loading/unloading decisions are performed by the Microprocessor to maintain leaving or return chilled liquid temperature. These decisions are a function of temperature deviation from setpoint.

A Master ON/Off switch is available to activate or deactivate the unit.

MICROPROCESSOR BOARD

The Microprocessor Board is the controller and decision maker in the control panel. System inputs such as pressure transducers and temperature sensors are connected directly to the Microprocessor Board. The Microprocessor Board circuitry multiplexes the analog inputs, digitizes them, and scans them to keep a constant watch on the chiller operating conditions. From this information, the Microprocessor then issues commands to the Relay Outputs to control contactors, solenoids, etc. for Chilled Liquid Temperature Control and to react to safety conditions.

Keypad commands are acted upon by the micro to change setpoints, cutouts, scheduling, operating requirements, and to provide displays.

The on-board power supply converts 24VAC from the 1T transformer to a +12VDC and +5VDC regulated supply located on the Microprocessor Board. This voltage is used to operate integrated circuitry on the board. The 40 character display and unit sensors are supplied power from the microboard 5VDC supply.

24VAC is rectified and filtered to provide unregulated +30VDC to supply the flow switch, PWM remote temperature reset, and demand limit circuitry which is available to be used with field supplied contacts.

The Microprocessor Board energizes on-board relays to output 120VAC to motor contactors, solenoid valves, etc. to control system operation. It also energizes solid state relays to output 24VAC to the EEVs if installed.

UNIT SWITCH

A UNIT ON/OFF switch is just underneath the keypad. This switch allows the operator to turn the entire unit OFF if desired. The switch must be placed in the ON position for the chiller to operate.

DISPLAY

The 40 Character Display (2 lines of 20 characters) is a liquid crystal display used for displaying system parameters and operator messages.

The display in conjunction with the keypad, allows the operator to display system operating parameters as well as access programmed information already in memory. The display has a lighted background for night viewing and for viewing in direct sunlight.

When a key is pressed, such as the OPER DATA key, system parameters will be displayed and will remain on the display until another key is pressed. The system parameters can be scrolled with the use of the up and down arrow keys. The display will update all information at a rate of about 2 seconds.

Display Messages may show characters indicating "greater than" (>) or "less than" (<). These characters indicate the actual values are greater than or less than the limit values which are being displayed.

KEYPAD

The 12 button non-tactile keypad allows the user to retrieve vitals system parameters such as system pressures, temperatures, compressor running times and starts, option information on the chiller, and system setpoints. This data is useful for monitoring chiller operation, diagnosing potential problems, troubleshooting, and commissioning the chiller.

It is essential the user become familiar with the use of the keypad and display. This will allow the user to make full use of the capabilities and diagnostic features available.

BATTERY BACK-UP

The Microprocessor Board contains a Real Time Clock integrated circuit chip with an internal battery backup. The purpose of this battery backup is to assure any programmed values (setpoints, clock, cutouts, etc.) are not lost during a power failure regardless of the time involved in a power cut or shutdown period.

UNIT STATUS

Pressing the STATUS key will enable the operator to determine current chiller operating status. The messages displayed will include running status, cooling demand, fault status, external cycling device status, load limiting and anti-recycle/coincident timer status. The display will be a single message relating to the highest priority message as determined by the micro. Status messages fall into the categories of General Status and Fault Status.

"STATUS" KEY

00066VIP

The following messages are displayed when the "Status" key is pressed. Following each displayed message is an explanation pertaining to that particular display.

GENERAL STATUS MESSAGES

In the case of messages which apply to individual systems, SYS 1 and SYS 2 messages will both be displayed and may be different. In the case of single system units, all SYS 2 messages will be blank.

UNIT SWITCH OFF
SHUTDOWN

This message informs the operator that the UNIT switch on the control panel is in the OFF position which will not allow the unit to run.

REMOTE CONTROLLED
SHUTDOWN

The REMOTE CONTROLLED SHUTDOWN message indicates that either an ISN system or RCC has turned the unit off, not allowing it to run.

DAILY SCHEDULE
SHUTDOWN

The DAILY SCHEDULE SHUTDOWN message indicates that the daily/holiday schedule programmed is keeping the unit from running.

FLOW SWITCH/REM STOP
NO RUN PERMMISSIVE

NO RUN PERM shows that the air proving switch, or remote start/stop contact wired in series with the air proving switch is open between terminals 13 and 14 of Terminal Block CTB1. This meaasge will only be displayed when the Control Mode is programmed for Discharge Air Temperature.

SYS 1 SYS SWITCH OFF
SYS 2 SYS SWITCH OFF

SYS SWITCH OFF tells that the system switch under OPTIONS is turned off. The system will not be allowed to run until the switch is turned back on.

SYS 1 NO COOL LOAD
SYS 2 NO COOL LOAD

This message informs the operator that the chilled liquid temperature is below the point (determined by the setpoint and control range) that the micro will bring on a system or that the micro has not loaded the lead system far enough into the loading sequence to be ready to bring the lag system ON. The lag system will display this message until the loading sequence is ready for the lag system to start.

In Suction Pressure Control Mode, the NO COOL LOAD message informs the operator that the respective zone thermostat is shutting the system off.

SYS 1 COMPS RUN X
SYS 2 COMPS RUN X

The COMPS RUNNING message indicates that the respective system is running due to demand. The "X" will be replaced with the number of compressors in that system that are running.

SYS 1 AR TIMER XX S
SYS 2 AR TIMER XX S

The anti-recycle timer message shows the amount of time left on the respective systems anti-recycle timer. This message is displayed when the system is unable to start due the anti-recycle timer being active.

```
SYS 1 ZONE THERM OFF
SYS 2 ZONE THERM OFF
```

These messages indicate that the zone thermostats for system 1 and system 2 are open. These messages will only be displayed when the Control Mode is programmed for Suction Pressure.

```
SYS 1 AC TIMER XX S
SYS 2 AC TIMER XX S
```

The anti-coincidence timer is a software feature that guards against 2 systems starting simultaneously. This assures instantaneous starting current does not become excessively high due to simultaneous starts. The micro limits the time between compressor starts to 1 minute regardless of demand or the anti-recycle timer being timed out. The anti-coincidence timer is only present on two system units.

```
SYS 1 DSCH LIMITING
SYS 2 DSCH LIMITING
```

When this message appears, discharge pressure limiting is in effect. The Discharge Pressure Limiting feature is integral to the standard software control; however the discharge transducer is optional on some models. Therefore, it is important to keep in mind that this control will not function unless the discharge transducer is installed in the system.

The limiting pressure is a factory set limit to keep the system from faulting on the high discharge pressure cutout due to high load or pull down conditions. When the unload point is reached, the micro will automatically unload the affected system by deenergizing one compressor. The discharge pressure unload will occur when the discharge pressure gets within 15 PSIG of the programmed discharge pressure cutout. This will only happen if the system is fully loaded and will shut only one compressor off. If the system is not fully loaded, discharge limiting will not go into effect. Reloading the affected system will occur when the discharge pressure drops to 85% of the unload pressure and 10 minutes have elapsed.

```
SYS 1 SUCT LIMITING
SYS 2 SUCT LIMITING
```

When this message appears, suction pressure limiting is in effect. Suction Pressure Limiting is only available on units that have the suction pressure transducer installed. If a low pressure switch is installed instead, suction pressure limiting will not function.

The suction pressure limit is a control point that limits the loading of a system when the suction pressure drops to within 15% above the suction pressure cutout. On a standard system programmed for 44 PSIG/3.0 Bar suction pressure cutout, the micro would inhibit loading of the affected system with the suction pressure less than or equal to 1.15 * 44 PSIG/3.0 Bar = 50 PSIG/3.5 Bar. The system will be allowed to load after 60 seconds and after the suction pressure rises above the suction pressure limit point.


```
SYS 1 LOAD LIMIT XX%
SYS 2 LOAD LIMIT XX%
```

This message indicates that load limiting is in effect and the percentage of the limiting in effect. This limiting could be due to the load limit/pwm input, ISN or RCC controller sending a load limit command.

```
MANUAL
OVERRIDE
```

If MANUAL OVERRIDE mode is selected, the STATUS display will display this message. This will indicate that the Daily Schedule is being ignored and the chiller will start-up when chilled liquid temperature allows, Remote Contacts, UNIT switch and SYSTEM switches permitting. This is a priority message and cannot be overridden by anti-recycle messages, fault messages, etc. when in the STATUS display mode. Therefore, do not expect to see any other STATUS messages when in the MANUAL OVERRIDE mode.

MANUAL OVERRIDE is to only be used in emergencies or for servicing. Manual override mode automatically disables itself after 30 minutes.

SYS 1 PUMPING DOWN
SYS 2 PUMPING DOWN

The PUMPING DOWN message indicates that a compressor in the respective system is presently in the process of pumping the system down. When pumpdown is initiated on shutdown, the liquid line solenoid or EEV will close and a compressor will continue to run. When the suction pressure decreases to the suction pressure cutout setpoint or runs for 180 seconds, whichever comes first, the compressor will cycle off.

FAULT STATUS MESSAGES

Safeties are divided into two categories – system safeties and unit safeties. System safeties are faults that cause the individual system to be shut down. Unit safeties are faults that cause all running compressors to be shut down. Following are display messages and explanations.

SYSTEM SAFETIES:

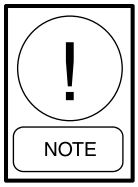
System safeties are faults that cause individual systems to be shut down if a safety threshold is exceeded for 3 seconds. They are auto reset faults in that the system will be allowed to restart automatically after the fault condition is no longer present. However, if 3 faults on the same system occur within 90 minutes, that system will be locked out on the last fault. This condition is then a manual reset. The system switch (under OPTIONS key) must be turned off and then back on to clear the lockout fault.

SYS 1 HIGH DSCH PRES
SYS 2 HIGH DSCH PRES

The Discharge Pressure Cutout is a software cutout in the microprocessor and is backed-up by a mechanical high pressure cutout switch located in the refrigerant circuit. It assures that the system pressure does not exceed safe working limits. The system will shutdown when the programmable cutout is exceeded and will be allowed to restart when the discharge pressure falls 40 PSIG below the cutout. *Discharge transducers must be installed for this function to operate.*

SYS 1 LOW SUCT PRESS
SYS 2 LOW SUCT PRESS

The Suction Pressure Cutout is a software cutout that helps protect the chiller from a coil freeze-up should the system attempt to run with a low refrigerant charge or a restriction in the refrigerant circuit.



Repeated starts after resetting a low suction pressure fault will cause evaporator freeze-up. Whenever a system locks out on this safety, immediate steps should be taken to identify the cause.

At system start, the cutout is set to 10% of programmed value. During the next 3 minutes the cutout point is ramped up to the programmed cutout point. If at any time during this 3 minutes the suction pressure falls below the ramped cutout point, the system will stop. *This cutout is ignored for the first 30 seconds of system run time to avoid nuisance shutdowns, especially on units that utilize a low pressure switch in place of the suction pressure transducer.*

After the first 3 minutes, if the suction pressure falls below the programmed cutout setting, a "transient protection routine" is activated. This sets the cutout at 10% of the programmed value and ramps up the cutout over the next 30 seconds. If at any time during this 30 seconds the suction pressure falls below the ramped cutout, the system will stop. This transient protection scheme only works if the suction pressure transducer is installed. When using the mechanical LP switch, the operating points of the LP switch are: opens at 23 PSIG +/- 5 PSIG (1.59 barg +/- .34 barg), and closes at 35 PSIG +/- 5 PSIG (2.62 barg +/- .34 barg).

SYS 1 MP / HPCO INHIB
SYS 2 MP / HPCO INHIB

The Motor Protector/Mechanical High Pressure Cutout protects the compressor motor from overheating or the system from experiencing dangerously high discharge pressure. This fault condition is present when CR1 (SYS 1) or CR2 (SYS 2) relays de-energize due to the HP switch or motor protector opening. This causes the respective CR contacts to open applying 0VDC on the input to the microboard. The fault condition is cleared when a 30VDC signal is restored to the input.

The internal motor protector opens at 185°F - 248°F (85°C - 120°C) and auto resets. The mechanical HP switch opens at 405 PSIG +/- 10 PSIG (27.92 barg +/- .69 barg) and closes at 330 PSIG +/- 25 PSIG (22.75 barg +/- 1.72 barg).

The compressor is also equipped with a discharge temperature sensor for the purpose of sensing internal scroll temperature. This sensor protects the scrolls from overheating due to inadequate cooling that may occur when the refrigerant charge is low, or superheat is too high. When the sensor senses a high temperature, it opens the motor protect circuit in the compressor causing the compressor to shut down.

During the first two faults an MP/HP INHIBIT message will be displayed and the system will not be locked out. Only after the 3rd fault will the MP/HP Fault message shown below be displayed on the status display. Additionally, the system will be locked out.

```
SYS 1 MP/HPCO FAULT
SYS 2 MP/HPCO FAULT
```

Whenever the motor protector or discharge sensor shuts down a compressor and the system, the internal compressor contacts will open for a period of 30 minutes to assure that the motor or scroll temperatures have time to dissipate the heat and cool down.

After 30 minutes, the contacts will close and the system will be permitted to restart. The micro will not try to restart the compressors in a system that shuts down on this safety for a period of 30 minutes to allow the internal compressor timer to time out.

```
SYS 1 HIGH MTR CURR
SYS 2 HIGH MTR CURR
```

When System Current Feedback option is selected (Option 11 under OPTIONS Key Current Feedback), this safety will operate as follows. If the actual voltage of the system exceeds the programmed trip voltage for 5 seconds, the system will shutdown. This fault will not be cleared until the condition causing the high current is no longer present.

UNIT SAFETIES:

Unit safeties are faults that cause all running compressors to be shut down. Unit faults are auto reset faults in that the unit will be allowed to restart automatically after the fault condition is no longer present.

```
UNIT FAULT:
LOW AMBIENT TEMP
```

The Low Ambient Temp Cutout is a safety shutdown designed to protect the chiller from operating in a low ambient condition. If the outdoor ambient temperature falls below the programmable cutout, the chiller will shut down. Restart can occur when temperature rises 2°F above the cutoff.


```
UNIT FAULT:
115VAC UNDER VOLTAGE
```

The Under Voltage Safety assures that the system is not operated at voltages where malfunction of the microprocessor could result in system damage. When the 115VAC to the micro panel drops below a certain level, a unit fault is initiated to safely shut down the unit. Restart is allowed after the unit is fully powered again and the anti-recycle timers have finished counting down.

```
UNIT FAULT:
HIGH MTR CURR
```

When the CURRENT FEEDBACK ONE PER UNIT option is selected under the OPTIONS Key, the unit will shut down when the voltage exceeds the programmed trip voltage for 5 seconds.

The trip voltage is programmed at the factory according to compressor or unit RLA.

Restart will occur after the anti-recycle timer times out.

UNIT WARNING

The following messages are not unit safeties and will not be logged to the history buffer. They are *unit warnings* and will not auto-restart. Operator intervention is required to allow a restart of the chiller.

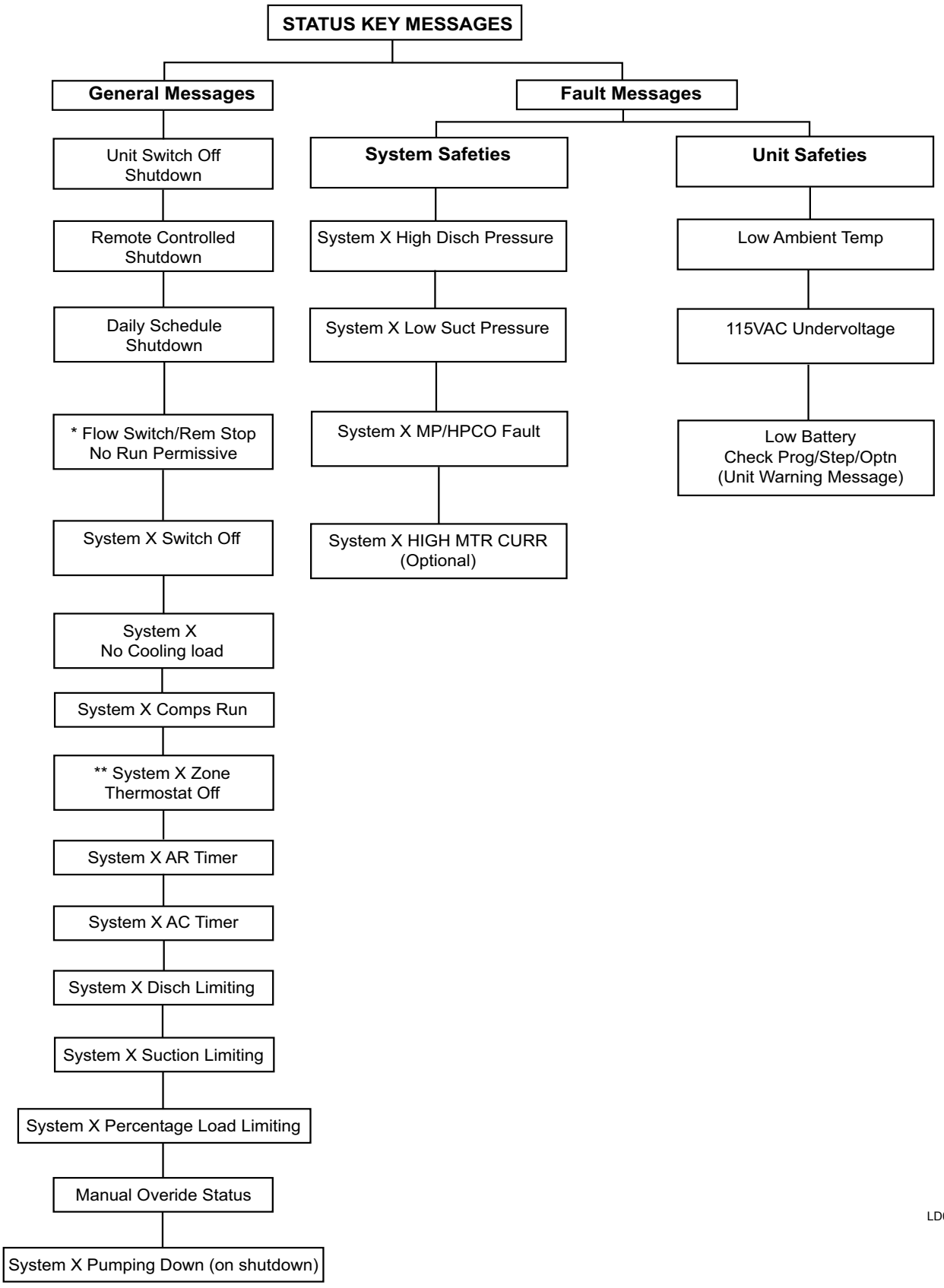
```
!! LOW BATTERY !!
CHECK PROG/SETP/OPTN
```

The Low Battery Warning can only occur at unit power-up. On micro panel power-up, the RTC battery is checked. If a low battery is found, all programmed setpoints, program values, options, time, schedule, and history buffers will be lost. These values will all be reset to their default values which may not be the desired operating values. Once a faulty battery is detected, the unit will be prevented from running until the PROGRAM key is pressed. Once PROGRAM is pressed the anti-recycle timers will be set to the programmed anti-recycle time to allow the operator time to check setpoints, and if necessary, reprogram programmable values and options.

If a low battery is detected, it should be replaced as soon as possible. The programmed values will all be lost and the unit will be prevented from running on the next power interruption. The RTC/battery is located at U17 on the microboard.

STATUS KEY MESSAGES

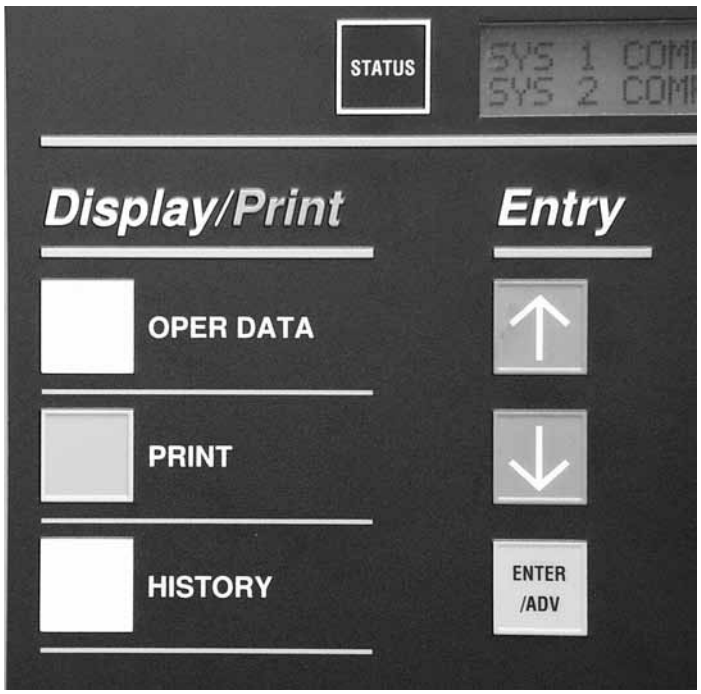
TABLE 17 – STATUS KEY MESSAGES



* Only displayed when unit control mode programmed for Discharge Air Temperature.

** Only displayed when unit control mode programmed for Suction Pressure.

DISPLAY/PRINT KEYS



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The Display/Print keys allow the user to retrieve system and unit information that is useful for monitoring chiller operation, diagnosing potential problems, troubleshooting, and commissioning the chiller.

System and unit information, unit options, setpoints, and scheduling can also be printed out with the use of a printer. Both real-time and history information are available.

OPER DATA KEY

The OPER DATA key gives the user access to unit and system operating parameters. When the OPER DATA key is pressed, system parameters will be displayed and remain on the display until another key is pressed. After pressing the OPER DATA key, the various operating data screens can be scrolled through by using the UP and DOWN arrow keys located under the "ENTRY" section.

NOTE

System 2 information will only be displayed for 2 system units.

With the "UNIT TYPE" set as a condensing unit (via jumper between J4-11 and J4-6 on the microboard), the following list of operating data screens are viewable under the Oper Data key in the order that they are displayed. The ↓ arrow key scrolls through the displays in the order they appear below:

NOTE

The chiller MUST be set to be a condensing unit via jumper between J4-11 and J4-6 on the microboard. DO NOT operate the equipment if not properly set up.

```
DISCHARGE AIR TEMP
= 57.4°F
```

This display shows the discharge air temperature leaving the evaporator. The display will only be shown when the Control Mode is programmed for Discharge Air (under the Options key). The minimum limit on the display for these parameters are 9.2°F (-12.7°C). The maximum limit on the display is 85.4°F (29.7°C).

```
AMBIENT AIR TEMP
= 87.5°F
```

This display shows the ambient air temperature. The minimum limit on the display is 0.4°F (-17.6°C). The maximum limit on the display is 131.2°F (55.1°C).

```
SYS X SP = 72.1 PSIG
      DP =227.0 PSIG
```

These displays show suction and discharge pressures for each system. The discharge pressure transducer is optional on some models.

If the *optional* discharge transducer is not installed, the discharge pressure would display 0 PSIG (0 barg).

Some models come factory wired with a low pressure switch in place of the suction transducer. In this case, the suction pressure would only be displayed as the maximum suction pressure reading of >200 PSIG (13.79 barg) when closed, or < 0 PSIG (0 barg) when open.

The minimum limits for the display are:
Suction Pressure: 0 PSIG (0 barg)
Discharge Pressure: 0 PSIG (0 barg)

The maximum limits for the display are:
Suction Pressure: 200 PSIG (13.79 barg)
Discharge Pressure: 400 PSIG (27.58 barg)

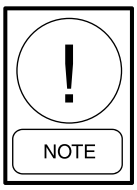
```
SYS X SUCTION TEMP
     = XXX.X°F
```

This message shows the suction line temperature of the respective refrigerant system. The minimum limit on the display for these parameters is 9.2°F (-12.7°C). The maximum limit on the display is 85.4°F (29.7°C). The temperatures sensors for this function are optional on all models.

```
SYS X HOURS 1 = XXXXX
     2= XXXXX, 3 = XXXXX
```

```
SYS X STARTS 1 = XXXXX
     2= XXXXX, 3 = XXXXX
```

The above two messages will appear sequentially for each system. The first display shows accumulated running hours of each compressor for the specific system. The second message shows the number of starts for each compressor on each system.



Run times and starts will only be displayed for the actual number of systems and compressors on the unit.

```
   LOAD TIMER  58 SEC
UNLOAD TIMER   0 SEC
```

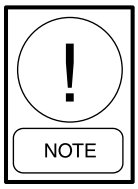
This display of the load and unload timers indicate the time in seconds until the unit can load or unload. Whether the systems loads or unloads is determined by how far the actual liquid temperature is from setpoint. A detailed description of unit loading and unloading is covered under the topic of Capacity Control. This display will not be visible in Suction Pressure Control mode.

```
TEMP ERROR XXX.X°F
TEMP RATE  XXX.X°F/M
```

This message will only be displayed when Discharge Air Control is selected. This message indicates the temperature error and the rate of change of the discharge air temperature.

```
   LEAD SYSTEM IS
SYSTEM NUMBER 2
```

This display will only be visible in Discharge Air Control mode and indicates the current LEAD system. In this example system 2 is the LEAD system, making system 1 the LAG system. The LEAD system can be manually selected or automatic. Refer to the programming under the "OPTIONS" key. The Lead System display will only appear on a two system unit.



A unit utilizing hot gas bypass should be programmed for MANUAL with system 1 as the lead system. Failure to do so will prevent hot gas operation if system 2 switches to the lead system when programmed for AUTOMATIC LEAD/LAG. This is not a problem if the YCU is fitted with hot gas on both systems.

```
EVAP PUMP IS ON
EVAP HEATER IS OFF
```

This display is for chiller applications only and does not apply to condensing units. However, the evaporator contacts could be used to control the air handler. Refer to the Unit Operation section under Evaporator Control Contacts.

The evaporator pump dry contacts are energized when any compressor is running, or the unit is not OFF on the daily schedule and the unit switch is on. However, even if one of above is true, the contacts will not close if the micropanel has been powered up for less than 30 seconds or if the contacts have been closed in the last 30 seconds to prevent motor overheating.

```
ACTIVE REMOTE CTRL
NONE
```

There are several types of remote systems that can be used to control or monitor the unit. The following messages indicate the type of remote control mode active:

NONE – no remote control active. Remote monitoring may be via ISN.

ISN – York Talk via ISN allows remote load limiting and temperature reset through an ISN system.

*LOAD LIM – load limiting enabled. Can be either stage 1 or stage 2 of limiting.

*PWM TEMP – EMS-PWM temperature reset

*Refer to the section on OPERATING CONTROLS

If the micro is programmed for CURRENT FEEDBACK ONE PER UNIT under the OPTIONS Key, the display will show up as the first display prior to the SYS 1 displays. Total chiller current is displayed as shown below:

```
UNIT AMPS = 54.0
VOLTS = 1.2
```

If the micro is programmed for CURRENT FEEDBACK NONE, no current display will appear.

```
SYS X COMP STATUS
1 = XXX 2 = XXX 3 = XXX
```

```
SYS X RUN TIME
XX-XX-XX-XX D-H-M-S
```

```
SYS X LLSV IS ON
HOT GAS SOL IS OFF
```

```
SYS X FAN STAGE 3
```

```
SYS X AMPS = 36.0
VOLTS = 0.8
```

The preceding five messages will appear sequentially, first for system 1, then for system 2.

The first message indicates the system and the associated compressors which are running.

The second message indicates the system run time in days – hours – minutes – seconds. Please note that this is not accumulated run time but pertains only to the current system cycle.

The third message indicates the system, and whether the liquid line solenoid or EEV pilot solenoid and hot gas solenoid are being turned on by the microboard. Please note that hot gas in not available for system 2, so there is no message pertaining to the hot gas solenoid when system 2 message is displayed.

The fourth message indicates what stage of condenser fan operation is active. For YCUL0016 to YCUL0086 unless a low ambient kit is added, only stages 1 and 3 will be used to cycle the condenser fans. However, stage 2 may be shown in this display without a low ambient kit added, but it has no effect. YCUL0090 - YCUL0130 have 3 or 4 fan stages as standard.

See the section on Condenser Fan Control in the UNIT OPERATION section for more information.

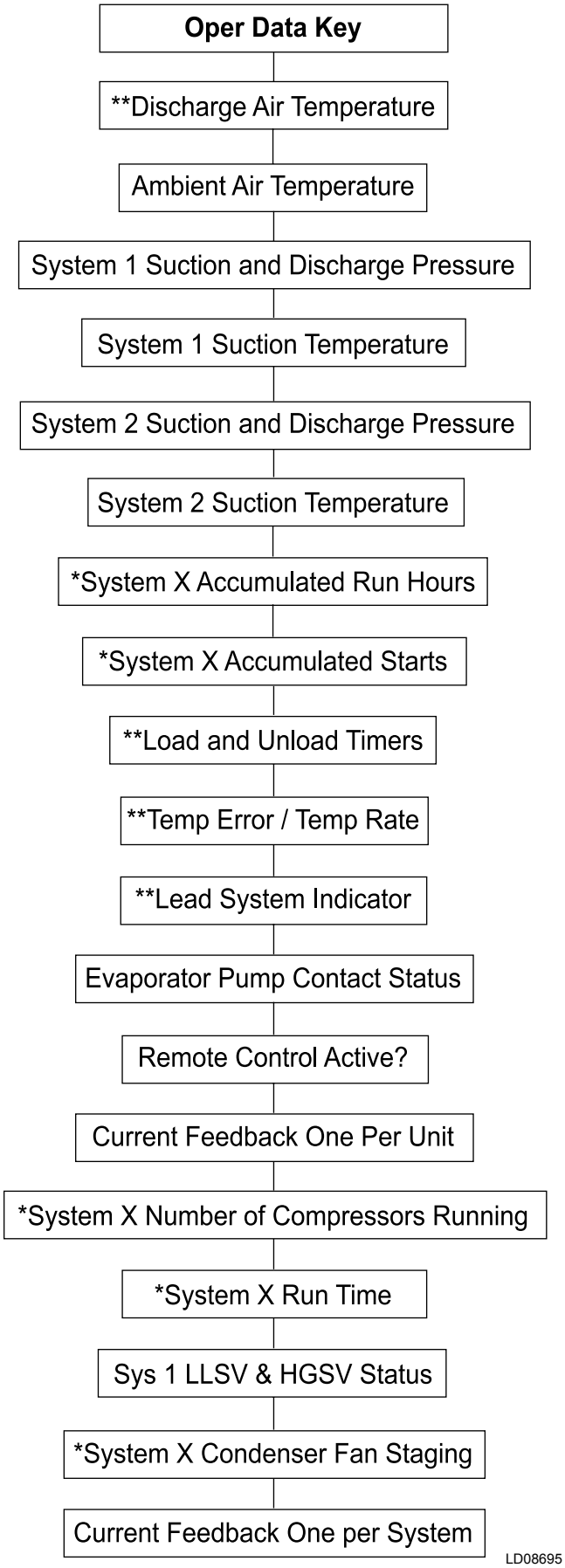
The fifth message displays current as sensed by the optional current feedback circuitry. The display reads out in amps along with the DC feedback voltage from the module. Current is calculated by $\frac{225A \bullet \text{Actual Volts}}{5 \text{ Volts}}$

Individual displays will be present for each system, if CURRENT FEEDBACK ONE PER SYSTEM is programmed under the OPTIONS Key. Combined compressor current for each system is displayed.

OPER DATA QUICK REFERENCE LIST

The following table is a quick reference list for information available under the OPER DATA key.

TABLE 18 – OPERATION DATA



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* Block of information repeats for each system

** Only displayed when Control Mode programmed for Discharge Air Temperature.

PRINT KEY

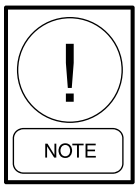
The PRINT key allows the operator to obtain a printout of real-time system operating data or a history printout of system data at the "instant of the fault" on the last six faults which occurred on the unit. An optional printer is required for the printout.

OPERATING DATA PRINTOUT

Pressing the PRINT key and then OPER DATA key allows the operator to obtain a printout of current system operating parameters. When the OPER DATA key is pressed, a snapshot will be taken of system operating conditions and panel programming selections. This data will be temporarily stored in memory and transmission of this data will begin to the printer. A sample Operating Data printout is shown below. (Note: Not all values are printed for all models.)

```
   YORK INTERNATIONAL CORPORATION
     MILLENNIUM CONDENSING UNIT
             UNIT STATUS
          9:32AM 26 NOV 02

SYS 1     ANTI-RECYCLE TIMER 59 SEC
SYS 2     ANTI-RECYCLE TIMER 59 SEC

               OPTIONS
AMBIENT CONTROL              STANDARD
LOCAL/REMOTE MODE              REMOTE
CONTROL MODE           DISCHARGE AIR
LEAD/LAG CONTROL           AUTOMATIC
FAN CONTROL          DISCHARGE PRESS
CURRENT FEEDBACK                NONE
COMPRESSOR LEAD/LAG         DISABLED
SOFT START                  DISABLED

            PROGRAM VALUES
DSCH PRESS CUTOUT           395 PSIG
SUCT PRESS CUTOUT            44 PSIG
LOW AMBIENT CUTOUT         25.0 DEGF
ANTI RECYCLE TIME           300 SECS
FAN CONTROL ON PRESS        240 PSIG
FAN DIFF OFF PRESS           65 PSIG
NUMBER OF COMPRESSORS             4
REFRIGERANT TYPE                R-22
REMOTE UNIT ID PROGRAMMED         0

              UNIT DATA
DISCHARGE AIR TEMP         67.0 DEGF
COOLING RANGE      55.0 +/- 5.0 DEGF
AMBIENT AIR TEMP           55.2 DEGF
LEAD SYSTEM                   SYS 1
EVAPORATOR PUMP                  ON
EVAPORATOR HEATER               OFF
ACTIVE REMOTE CONTROL           ISN
SOFTWARE VERSION        C.MMC.03.02
```

```
            SYSTEM 1 DATA
COMPRESSOR STATUS                OFF
RUN TIME       0- 0- 0- 0 D-H-M-S
SUCTION PRESSURE            68 PSIG
DISCHARGE PRESSURE         271 PSIG
SUCTION TEMPERATURE      49.9 DEGF
LIQUID LINE SOLENOID             OFF
HOT GAS BYPASS VALVE             OFF
CONDENSER FAN STAGES             OFF

            SYSTEM 2 DATA
COMPRESSOR STATUS                OFF
RUN TIME       0- 0- 0- 0 D-H-M-S
SUCTION PRESSURE            75 PSIG
DISCHARGE PRESSURE         247 PSIG
SUCTION TEMPERATURE      57.2 DEGF
LIQUID LINE SOLENOID             OFF
CONDENSER FAN STAGES             OFF

            DAILY SCHEDULE
S M T* W T F S             *=HOLIDAY
SUN START=00:00AM    STOP=00:00AM
MON START=00:00AM    STOP=00:00AM
TUE START=00:00AM    STOP=00:00AM
WED START=00:00AM    STOP=00:00AM
THU START=00:00AM    STOP=00:00AM
FRI START=00:00AM    STOP=00:00AM
SAT START=00:00AM    STOP=00:00AM
HOL START=00:00AM    STOP=00:00AM
```



See Service And Troubleshooting section for Printer Installation information.

HISTORY PRINTOUT

Pressing the PRINT key and then the HISTORY key allows the operator to obtain a printout of information relating to the last 6 Safety Shutdowns which occurred. The information is stored at the instant of the fault, regardless of whether the fault caused a lockout to occur. The information is also not affected by power failures (long-term internal memory battery backup is built into the circuit board) or manual resetting of a fault lock-out.

When the HISTORY key is pressed, a printout is transmitted of all system operating conditions which were stored at the "instant the fault occurred" for each of the 6 Safety Shutdowns buffers. The printout will begin with the most recent fault which occurred. The most recent fault will always be stored as Safety Shutdown No. 1. Identically formatted fault information will then be printed for the remaining safety shutdowns.

Information contained in the Safety Shutdown buffers is very important when attempting to troubleshoot a system problem. This data reflects the system conditions at the instant the fault occurred and often reveals other system conditions which actually caused the safety threshold to be exceeded.

The history printout is similar to the operational data printout shown in the previous section. The differences are in the header and the schedule information. The daily schedule is not printed in a history print.

One example history buffer printout is shown following. The data part of the printout will be exactly the same as the operational data print so it is not repeated here. The difference is that the Daily Schedule is not printed in the history print and the header will be as follows.

```
YORK INTERNATIONAL CORPORATION
MILLENNIUM LIQUID CHILLER

SAFETY SHUTDOWN NUMBER 1
SHUTDOWN @ 3:56PM  29 JAN 02

SYS 1   HIGH DSCH PRESS SHUTDOWN
SYS 2                NO FAULTS
```

HISTORY DISPLAYS

The HISTORY key gives the user access to many unit and system operating parameters at the time of a unit or system safety shutdown. When the HISTORY key is pressed the following message is displayed.

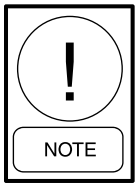
```
DISPLAY SAFETY SHUT-
DOWN NO. 1 (1 TO 6)
```

While this message is displayed, the UP arrow key can be used to select any of the six history buffers. Buffer number 1 is the most recent, and buffer number 6 is the oldest safety shutdown that was saved.

After selecting the shutdown number, pressing the ENTER key displays the following message which shows when the shutdown occurred.

```
SHUTDOWN OCCURRED
03:56 PM 29 JAN 02
```

Pressing the DOWN arrow key repeatedly from the DISPLAY SAFETY SHUTDOWN NO. X displays the software version.



The version shown below is only a sample. The EPROM's for YCUL 0016-0090 and YCUL 0096-0130 each have their own part and version number.

```
SOFTWARE VERSION
C.MMC.04.01
```

The UP and DOWN arrows are used to scroll forward and backward through the history buffer to display the shutdown conditions stored at the instant the fault occurred. The ↓ arrow key scrolls through the displays in the order they appear below:

```
UNIT FAULT:
LOW SUCT PRESS
```

Displays the type of fault that occurred.

```
UNIT TYPE
CONDENSING UNIT
```

Displays the type of chiller; Liquid, Condensing Unit or Heat Pump.

```
AMBIENT CONTROL
XXXXXXXXXX
```

Displays the type of ambient control; Standard or Low Ambient. This message will not be displayed on YCUL0096 – YCUL0130.

```
LOCAL/REMOTE MODE
XXXXXXXXX
```

Displays Local or Remote control selection.

```
CONTROL MODE
LEAVING LIQUID
```

Displays the type of chilled liquid control; Leaving or Return.

```
LEAD/LAG CONTROL
XXXXXXXX
```

Displays the type of lead/lag control; Manual System 1, Manual System 2 or Automatic. This is only selectable on 2-system units.

```
FAN CONTROL
DISCHARGE PRESSURE
```

Displays the type of fan control; Discharge Pressure or Ambient and Discharge Pressure. This message will not be displayed on YCUL0096 – YCUL0130.

```
MANUAL OVERRIDE MODE
XXXXXXXXX
```

Displays whether manual override was Enabled or Disabled.

```
CURRENT FEEDBACK
XXXXXXXXXXXXXXXX
```

Displays type of Current Feedback utilized.

```
SOFT START
XXXXXXX
```

Displays whether the optional European Soft Start was installed and selected.

```
DISCHARGE PRESSURE
CUTOUT = XXXX PSIG
```

Displays the programmed Discharge Pressure Cutout.

```
SUCTION PRESSURE
CUTOUT = XXXX PSIG
```

Displays the programmed Suction Pressure Cutout.

```
LOW AMBIENT TEMP
CUTOUT = XXX.X °F
```

Displays the programmed Low Ambient Cutout.

```
FAN CONTROL ON
PRESSURE=XXX PSIG
```

Displays the programmed Fan On Pressure.

```
FAN DIFFERENTIAL OFF
PRESSURE=PSIG
```

Displays the programmed Fan Off Differential.

```
SYS1 TRIP VOLTS
= X.X VOLTS
```

Displays the programmed High Current Trip Voltage.

```
SYS2 TRIP VOLTS
= X.X VOLTS
```

Displays the programmed High Current Trip Voltage.

```
SETPOINT = XXX.X °F
RANGE = +/- °F
```

Displays the programmed Setpoint and Range, if the chiller is programmed for DAT Control mode.

```
SYS 1 SP = XXXX PSIG
RANGE = +/- XXX PSIG
```

```
SYS 2 SP = XXXX PSIG
RANGE = +/- XXX PSIG
```

Displays the programmed Setpoint and Range for each system, if the chiller is programmed for Suction Pressure Control mode.

```
AMBIENT AIR TEMP
= XXX.X °F
```

Displays the Ambient Temp. at the time of the fault.

```
LEAD SYSTEM IS
SYSTEM NUMBER X
```

Displays which system is in the lead at the time of the fault. This display will not be visible in Suction Pressure Control mode.

```
EVAP PUMP IS XXX
EVAP HEATER IS XXX
```

Displays status of the evaporator pump and heater at the time of the fault. Detail of the use of this contact status is explained under the OPER DATA key.

```
ACTIVE REMOTE CTRL
XXXX
```

Displays whether Remote Chiller Control was active when the fault occurred.

```
UNIT ACTUAL AMPS
=XXX.X AMPS
```

This is only displayed when the Current Feedback Option is one per unit.

```
SYS X COMP STATUS
1=XXX 2=XXX 3=XXX
```

Displays which compressors were running in the system when the fault occurred.

```
SYS X RUN TIME
XX-XX-XX-XX D-H-M-S
```

Displays the system run time when the fault occurred.

```
SYS X SP = XXXX PSIG
DP = XXXX PSIG
```

Displays the system Suction and Discharge Pressure of the time of the fault.

```
SYS X SUCT = XXX.X °F
```

Displays the System Suction Temp.

```
SYS X LLSV IS XXX
HOT GAS SOL IS XXX
```

Displays whether the System Liquid Line Solenoid or Hot Gas Solenoid was energized at the time of the fault.

```
SYS X FAN STAGE XXX
```

Displays the number of fan stages in the system active at the time of the fault.

```
SYS X AMPS = 40.3
VOLTS = 2.2
```

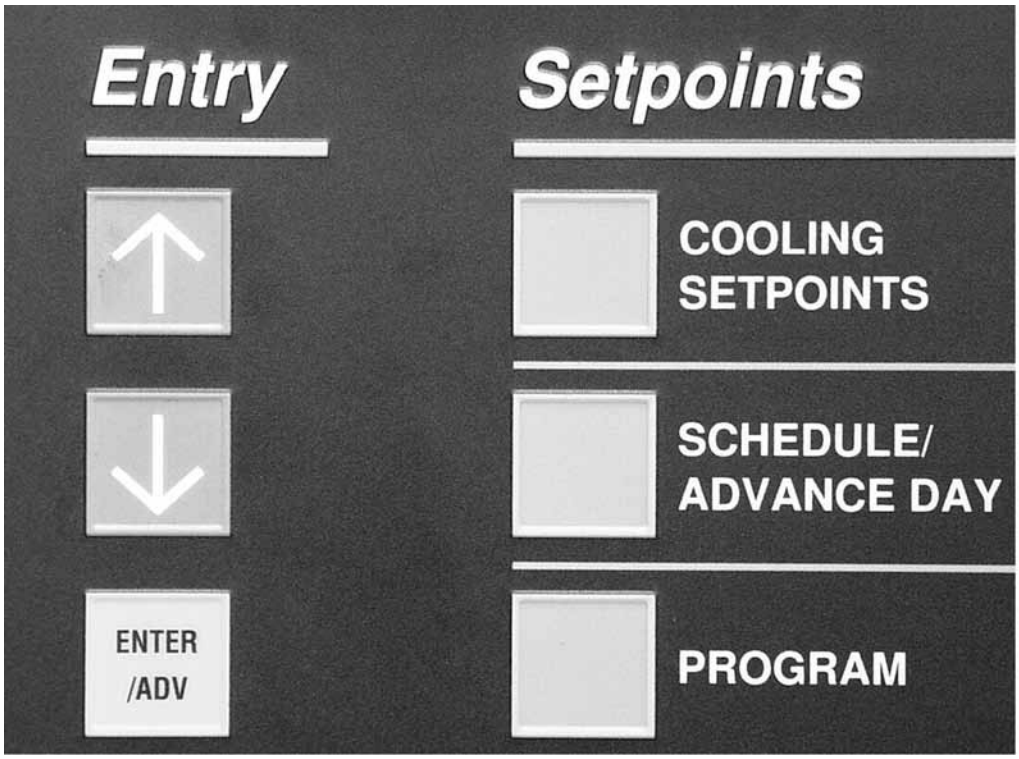
Displays the system amperage (calculated approximately) and, DC feedback voltage from the 2ACE Module, at the time of the fault.

For this message to appear, CURRENT FEEDBACK ONE PER SYSTEM must be programmed under the options key. If the micro is programmed as one CURRENT FEEDBACK ONE PER UNIT under the program key, the display will be the first display prior to the SYS 1 info. If the micro is programmed for CURRENT FEEDBACK NONE, no current display will appear.

Displays for System 1 starting with SYS X NUMBER OF COMPS RUNNING X through SYS X AMPS = XXX.X VOLTS = X.X will be displayed first, followed by displays for System 2.

Further explanation of the above displays is covered under the STATUS, OPER DATA, COOLING SETPOINTS, PROGRAM, and OPTIONS keys.

"ENTRY" KEYS



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The Entry Keys allow the user to view, change programmed values. The ENTRY keys consist of an UP ARROW key, DOWN ARROW key, and an ENTER/ADV key.

UP AND DOWN ARROW KEYS

Used in conjunction with the OPER DATA, HISTORY, COOLING SETPOINTS, SCHEDULE/ADVANCE DAY, OPTIONS and CLOCK keys, the UP and DOWN arrow keys allow the user to scroll through the various data screens. Refer to the section on "DISPLAY/PRINT" keys for specific information on the displayed information and specific use of the UP and DOWN arrow keys.

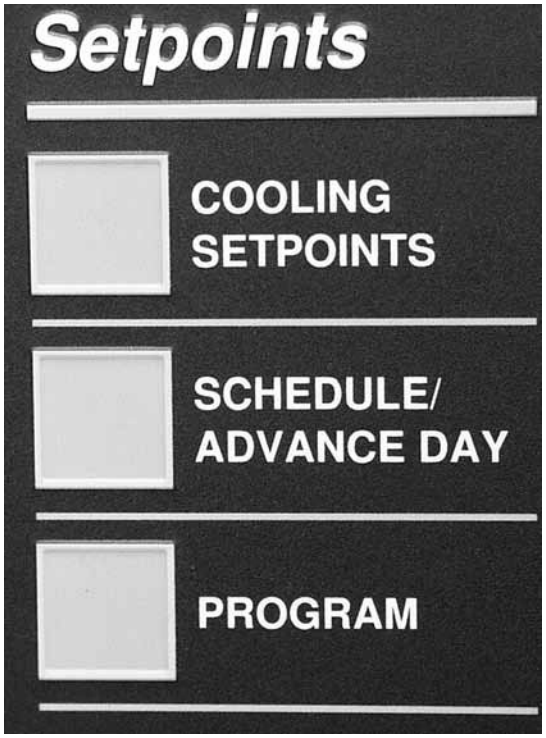
The UP and DOWN arrow keys are also used for programming the control panel such as changing numerical or text values when programming cooling setpoints, setting the daily schedule, changing safety setpoints, chiller options, and setting the clock.

ENTER/ADV KEY

The ENTER key must be pushed after any change is made to the cooling setpoints, daily schedule, safety setpoints, chiller options, and the clock. Pressing this key "enters" the new values into memory. If the ENTER key is not pressed after a value is changed, the changes will not be "entered" and the original values will be used to control the chiller.

Programming and a description on the use of the UP and DOWN arrow and ENTER/ADV keys are covered in detail under the SETPOINTS, and UNIT keys.

"SETPOINTS" KEYS



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Programming of the cooling setpoints, daily schedule, and safeties is accomplished by using the keys located under the SETPOINTS section.

The three keys involved are labeled COOLING SETPOINTS, SCHEDULE/ADVANCE DAY, and PROGRAM.

Following are instructions for programming the respective setpoints. The same instruction should be used to view the setpoints with the exception that the setpoint will not be changed.

COOLING SETPOINTS

The Cooling setpoint and Range can be programmed by pressing the COOLING SETPOINTS key. After pressing the COOLING SETPOINTS key, the Cooling Mode (Discharge Air Temperature or Suction Pressure Control) will be displayed for a few seconds, and then the setpoint entry screen will be displayed.

Following are the four possible messages that can be displayed after pressing the COOLING SETPOINT key, indicating the cooling mode:

LOCAL DISCHARGE AIR TEMP CONTROL

This message indicates that the cooling setpoint is under LOCAL control. That is, the cooling setpoint is controlling to the *locally* programmed setpoint. The message also indicates that the control point is based on Discharge Air temperature leaving the evaporator coil.

LOCAL SUCTION PRESSURE CONTROL

This message indicates that the cooling setpoint is under LOCAL control (the cooling setpoint is controlling to the *locally* programmed cooling setpoint). However, unlike the previous message, it is now indicating that the control point is based on Suction Pressure.

NOTE

Unit must first be checked for "Unit Type - Condensing Unit" under the Option Key to allow programming of appropriate setpoints. This is accomplished by the jumper between J4-11 and J4-6 on the microboard.

```
REMOTE DISCHARGE
AIR TEMP CONTROL
```

This message indicates that the cooling setpoint is under REMOTE control. When under remote control, the cooling setpoint will be determined by a remote device such as an ISN control. The message also indicates that the control point is based on Discharge Air Temperature leaving the evaporator.

```
REMOTE SUCTI ON
PRESSURE CONTROL
```

This message indicates that the cooling setpoint is under REMOTE control. When under remote control, the cooling setpoint will be determined by a remote device such as an ISN control. This message also indicates that the control point is based on Suction Pressure.

Immediately after the control mode message is displayed, the COOLING SETPOINT entry screen will be displayed. If the unit is programmed for Discharge Air Temperature the following message will be displayed:

```
SETPOINT = 55.0°F
 RANGE = +/-5.0°F
```

(Discharge Air Temperature control)

The above message shows the current Discharge Air temperature SETPOINT at 55.0°F (notice the cursor positioned under the number 5). Pressing either the UP or DOWN arrow will change the setpoint in .5°F increments. After using the UP and DOWN arrows to adjust to the desired setpoint, the ENTER/ADV key must be pressed to enter this number into memory and advance to the RANGE SETPOINT.

This will be indicated by the cursor moving under the RANGE setpoint. The UP and DOWN arrow keys are used to set the RANGE, in .5 °F increments, to the desired RANGE setpoint. After adjusting the setpoint, the ENTER/ADV key must be pressed to enter the data into memory.

The Discharge Air temperature SETPOINT is programmed from 45°F to 70°F. The Control Range is programmed from 3.0°F to 10°F.

If the unit was programmed for Suction Pressure control, the following message would be displayed instead of the previous message.

```
SYS X SP = 70 PSIG
 RANGE = +/- 3 PSIG
```

(Suction Pressure control)

The setpoint and range are programmed with the UP arrow. DOWN arrow, and ENTER/ADV key as described in the previous setpoint message. The setpoints in Suction Pressure Control are the suction pressures of each individual system on the condensing Unit and will control to within +/- the cooling range. This method of control cannot be used unless the unit is equipped with suction transducers (optional on YCUL0016 - YCUL0066).

On two system units (YCUL0046 - YCUL0130), each system is controlled independently of each other according to its own setpoint and cooling range, so there will be two similar displays - a setpoint and range for both system 1 and system 2.

The Suction Pressure SETPOINTS are programmable from 60 PSIG to 90 PSIG. The Control Range is programmable from 2 PSIG to 10 PSIG.

Both Discharge Air Temperature and Suction Pressure control are described in detail under the section on Capacity Control.

Pressing the COOLING SETPOINTS again, after setting the “local” setpoint(s), will display the remote setpoint and cooling range. This display automatically updates about every 2 seconds. Notice that these setpoints are not “locally” programmable, but are controlled by a remote device such as an ISN control. These setpoints would only be valid if the unit was operating in the REMOTE mode. The following messages illustrate both Discharge Air Temperature and Suction Pressure control respectively.

```
REM SETP = 55.0°F
 RANGE = +/-5.0°F
```

(Discharge Air Temperature control)

```
REM SP X = 70 PSIG
 RANGE = +/- 3 PSIG
```

(Suction Pressure control)

Pressing the COOLING SETPOINTS again will bring up the display that allows the Maximum EMS-PWM Temperature Reset to be programmed. This message is shown below.

```
MAX EMS-PWM REMOTE
TEMP RESET = +20°F
```

The Temp Reset value is the maximum allowable reset of the Discharge Air Temperature Setpoint. The setpoint can be reset upwards by the use of a contact closure on the PWM Temp Reset input (CTB1 terminals 13 - 20). See the section on Operating Controls for a detailed explaintion of this feature.

As with the other setpoints, the Up Arrow and Down Arrow keys are used to change the Temp Reset value. After using the UP and DOWN ARROWS to adjust to the desired setpoint, the ENTER/ADV key must be pressed to enter this number into memory.

The low limit, high limit, and default values for the keys under "SETPOINTS" are listed in Table 16.

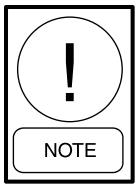
SCHEDULE/ADVANCE DAY KEY

The SCHEDULE is a seven day daily schedule that allows one start/stop time per day. The schedule can be programmed Monday through Sunday with an alternate holiday schedule available. If no start/stop times are programmed, the unit will run on demand, providing the unit is not shut off on a unit or system shutdown. The daily schedule is considered "not programmed" when the times in the schedule are all zeros (00:00 AM).

To set the schedule, press the SCHEDULE/ADVANCE DAY key. The display will immediately show the following display.

```
MON START = 00:00 AM
      STOP = 00:00 AM
```

The line under the 0 is the cursor. It may be changed by using the UP and DOWN arrow keys until correct. Pressing the ENTER/ADV key will enter the times and then move the cursor to the minute box. The operation is then repeated if necessary. This process may be followed until the hour, minutes, and meridian (AM or PM) of both the START and STOP points are set. After changing the meridian of the stop time, pressing the ENTER/ADV key will advance the schedule to the next day.



Whenever the daily schedule is changed for Monday, all the other days will change to the new Monday schedule. This means if the Monday times are not applicable for the whole week then the exceptional days would need to be reprogrammed to the desired schedule.

To page to a specific day press the SCHEDULE/*ADVANCE DAY* key. The start and stop time of each day may be programmed differently using the UP and DOWN arrow, and ENTER/ADV keys.

After SUN (Sunday) schedule appears on the display a subsequent press of the SCHEDULE/ADVANCE DAY key will display the Holiday schedule. This is a two part display. The first reads:

```
HOL START = 00:00 AM
      STOP = 00:00 AM
```

The times may be set using the same procedure as described above for the days of the week. After changing the meridian of the stop time, pressing the ENTER/ADV key will advance the schedule to the following display:

```
S_M T W T F S
HOLIDAY NOTED BY *
```

The line below the empty space next to the S is the cursor and will move to the next empty space when the ENTER/ADV key is pressed. To set the Holiday, the cursor is moved to the space following the day of the week of the holiday and the UP arrow key is pressed. An * will appear in the space signifying that day as a holiday. The * can be removed by pressing the DOWN arrow key.

The Holiday schedule must be programmed weekly - once the holiday schedule runs, it will revert to the normal daily schedule.

TABLE 19 – COOLING SETPOINTS PROGRAMMABLE LIMITS AND DEFAULTS

SETPOINT VALUE	LOW LIMIT	HIGH LIMIT	DEFAULT
Discharge Air Temp. Setpoint	45.0 °F	70.0°F	44.0°F
	7.2°C	21.1°C	12.7°C
Discharge Air Temp. Range	3.0°F	10.0°F	5.0°F
	1.7°C	5.6°C	2.8°C
Suction Pressure Setpoints	60 PSIG	90 PSIG	70 PSIG
	4.14 BARS	6.21 BARS	4.83 BARS
Suction Pressure Range	2 PSIG	10 PSIG	3 PSIG
	.13 BARS	.69 BARS	.20 BARS
Max EMS - PWM Remote Temp. Reset	2°F	40°F	20°F
	1°C	22°C	11°C

PROGRAM KEY

There are six operating parameters under the PROGRAM key that are programmable. These setpoints can be changed by pressing the PROGRAM key, and then the ENTER/ADV key to enter *Program Mode*. Continuing to press the ENTER/ADV key will display each operating parameter. While a particular parameter is being displayed, the UP and DOWN arrow keys can be used to change the value. After the value is changed, the ENTER/ADV key must be pressed to enter the data into memory. Table 19 shows the programmable limits and default values for each operating parameter.

Following are the displays for the programmable values in the order they appear:

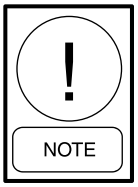
```
DISCHARGE PRESSURE
CUTOUT = 395 PSIG
```

DISCHARGE PRESSURE CUTOUT is the discharge pressure at which the system will shutdown as monitored by the *optional* discharge transducer. This is a software shutdown that acts as a backup for the mechanical high pressure switch located in the refrigerant circuit. The system can restart when the discharge pressure drops 40 PSIG (2.76 BARG) below the cutout point.

If the optional discharge pressure transducer is not installed, this programmable safety would not apply. It should be noted that every system has a *mechanical* high pressure cutout that protects against excessive high discharge pressure regardless of whether or not the optional discharge pressure is installed.

```
SUCTION PRESSURE
CUTOUT = 44.0 PSIG
```

The SUCTION PRESSURE CUTOUT protects the chiller from an evaporator freeze-up. If the suction pressure drops below the cutout point, the system will shut down.



There are some exceptions when the suction pressure is permitted to temporarily drop below the cutout point. Details are explained under the topic of System Safeties.

```
LOW AMBIENT TEMP
CUTOUT = 25.0°F
```

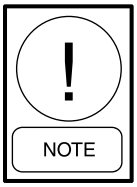
The LOW AMBIENT TEMP CUTOUT allows the user to select the chiller outside ambient temperature cutout point. If the ambient falls below this point, the chiller will shut down. Restart can occur when temperature rises 2°F (1.11°C) above the cutout setpoint.

```
ANTI RECYCLE TIMER
= 600 SEC
```

The programmable anti-recycle timer assures that systems do not cycle. This timer is programmable under the PROGRAM key between 300 - 600 seconds. Whenever possible, to reduce cycling and motor heating, the anti-recycle timer should be adjusted as high as possible. The programmable anti-recycle timer starts the timer when the first compressor in a system starts. The timer begins to count down. If all the compressors in the circuit cycle off, a compressor within the circuit will not be permitted to start until the anti-recycle timer has timed out. If the lead system has run for less than 5 minutes, 3 times in a row, the anti-recycle timer will be extended to 10 minutes maximum.

```
FAN CONTROL ON
PRESSURE=XXXPSIG
```

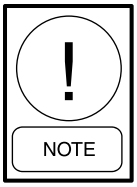
The Fan Control On-Pressure is the programmed pressure value that is used to stage the condenser fans on, in relation to discharge pressure. Refer to Condenser Fan Control in the UNIT OPERATION section and Tables 27 - 32.



The microprocessor will not allow programming the "FAN CONTROL ON PRESSURE" minus the "FAN CONTROL DIFFERENTIAL OFF PRESSURE" below 160PSIG. This assures discharge pressure does not drop too low.

```
FAN DIFFERENTIAL OFF
PRESSURE = XXX PSIG
```

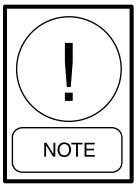
The Fan Differential Off Pressure is the programmed differential pressure value that is used to stage the condenser fans off, in relation to discharge pressure. Refer to Condenser Fan Control in the UNIT OPERATION section and Tables 27 - 32.



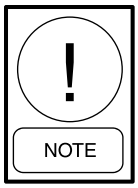
The microprocessor will not allow programming the "FAN CONTROL ON PRESSURE" minus the "FAN CONTROL DIFFERENTIAL OFF PRESSURE" below 160 PSIG. This assures discharge pressure does not drop too low.

```
TOTAL NUMBER OF
COMPRESSORS = 6
```

The TOTAL NUMBER OF COMPRESSORS are the amount of compressors in the chiller, and determines the stages of cooling available. Notice in Table 14 that the selection available will vary depending on the unit model.



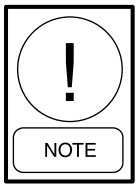
This MUST be programmed correctly to assure proper condensing unit operation.



A single system chiller MUST have a jumper between terminals 13 - 17 on terminal block CTB1. If the jumper is not installed, the unit will act as a 2-system chiller. The jumper is only checked by the micro at unit power-up. If the jumper is removed, power must be removed and re-applied to register the change in memory.

```
NUMBER OF FANS
PER SYSTEM = X
```

The number of fans per system is programmed for the total number of fans on each system, or the total number on the chiller divided by 2. This is only programmable on YCUL0096 - YCUL0130 chillers.



This MUST be programmed correctly to assure proper condensing unit operation.

```
SYS X TRIP VOLTS
=X.X VOLTS
```

```
UNIT TRIP VOLTS
=X.X VOLTS
```

Depending on the option, the trip voltage for a specific system or unit high current trip (See page 120) can be programmed. It also calibrates the current readout under the OPER DATA key. The approximate programmed value is calculated using the following formulas:

460VAC SYSTEM TRIP VOLTS

For individual system high current trip programming on 460VAC chillers:

- Add the sum of the compressor and fan RLA's in the system
- Multiply the sum by 1.25
- Divide by 225A
- The resulting voltage is the value that should be programmed

For example, if fan and compressor RLA's total 100A:

$$\frac{5V \times 100A}{225A} \times 1.25 = \frac{625VA}{225A} = 2.8V$$

The programmed value will be 2.8V. A similar calculation and programming will be necessary for the other system in a 2-system chiller.

460VAC UNIT TRIP VOLTS

For total chiller high current trip programming on 460VAC chillers:

- Add the sum of all the the compressor and fan RLA's in the chiller
- Multiply the sum by 1.25
- Divide by 225A
- The resulting voltage is the value that should be programmed

For example, if fan and compressor RLA's total 180A:

$$\frac{5V \times 180A}{225A} \times 1.25 = \frac{1125VA}{225A} = 5.0V$$

The programmed value will be 5.0V.

208/230VAC CHILLERS

On 208/230VAC chillers, the process is similar, but instead of performing the calculation using 225A, a number of 450A must be substituted.

REMOTE UNIT ID
PROGRAMMED = X

When communications is required with a BAS or OptiView Panel, individual unit IDs are necessary for communications with specific chillers on a single RS-485 line. ID 0-7 is selectable.

TABLE 20 – PROGRAM KEY LIMITS AND DEFAULTS

PROGRAM VALUE	MODE	LOW LIMIT	HIGH LIMIT	DEFAULT
DISCHARGE PRESSURE CUTOUT	--	200 PSIG	399 PSIG	395 PSIG
		13.8 BARG	27.5 BARG	27.2 BARG
SUCTION PRESSURE CUTOUT	WATER COOLING	44.0 PSIG	70.0 PSIG	44.0 PSIG
		3.03 BARG	4.83 BARG	3.03 BARG
LOW AMBIENT TEMP. CUTOUT	STANDARD AMBIENT	25.0°F	60.0°F	25.0°F
		-3.9°C	15.6°C	-3.9°C
	LOW AMBIENT	0°F	60.0°F	25.0°F
		-17.8°C	15.6°C	-3.9°C
ANTI-RECYCLE TIMER	--	300 SEC.	600 SEC.	600 SEC.
FAN CONTROL ON PRESSURE	--	225 PSIG	300 PSIG	240 PSIG
		15.5 BARG	20.7 BARG	16.5 BARG
FAN DIFFERENTIAL OFF PRESSURE	--	50 PSIG	100 PSID*	80 PSID
		3.45 BARG	6.89 BARG*	5.52 BARG
TOTAL NUMBER OF COMPRESSORS	SINGLE SYSTEM	2	3	3
	TWO SYSTEMS	4	6	6
NUMBER OF FANS PER SYSTEM	YCUL0096 - YCUL0130 ONLY	3	4	3
UNIT/SYSTEM TRIP VOLTS	CURRENT FEEDBACK OPTION ENABLED ONE PER UNIT	0.5	4.5	2
REMOTE UNIT ID	--	0	7	0

* The minimum discharge pressure allowed is 160 PSIG. The fan differential Off Pressure will be lowered to prevent going below 160 PSIG based on where the fan control On Pressure is programmed.

OPER DATA QUICK REFERENCE LIST

Table 21 provides a quick reference of the setpoints list for the Setpoints Keys.

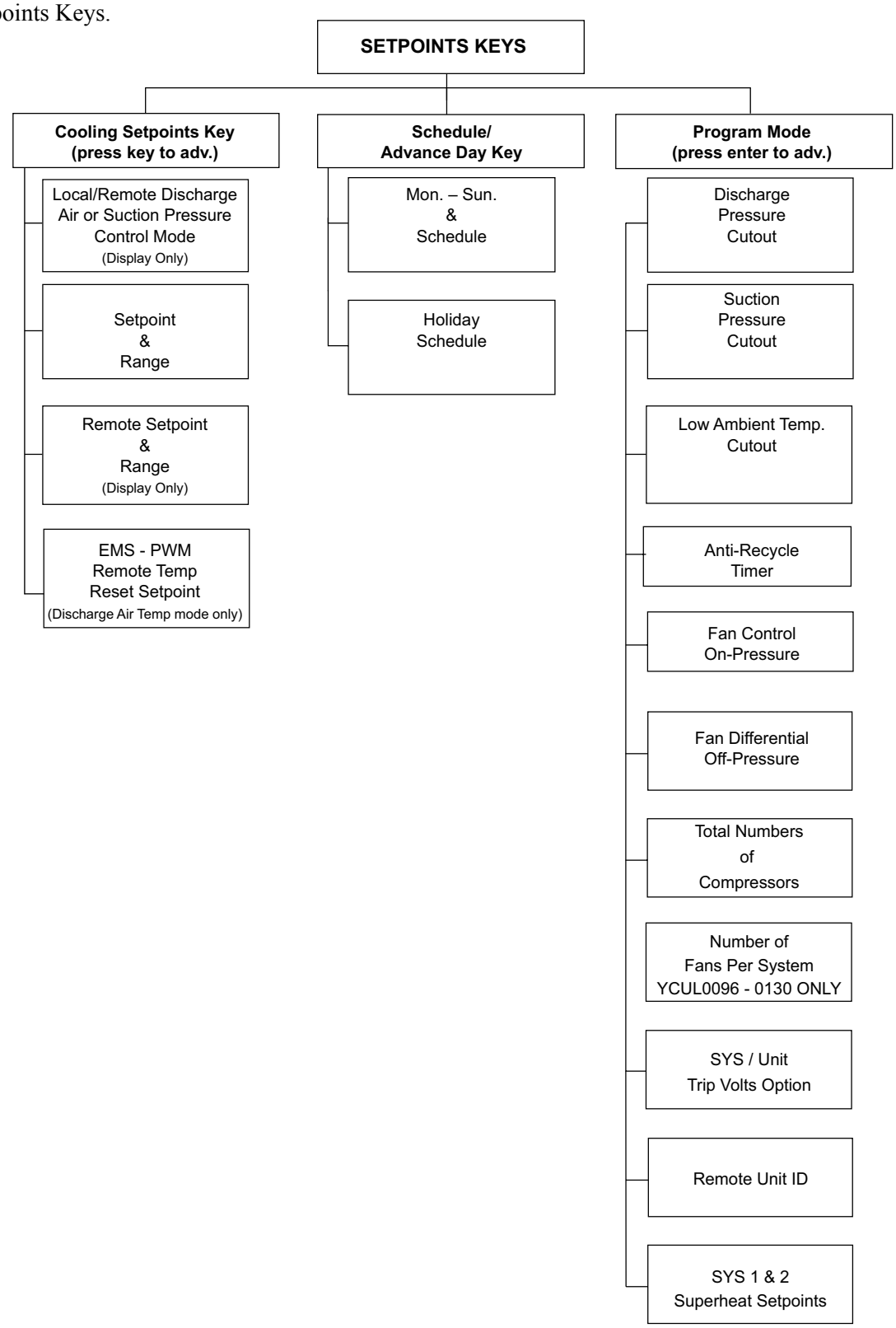


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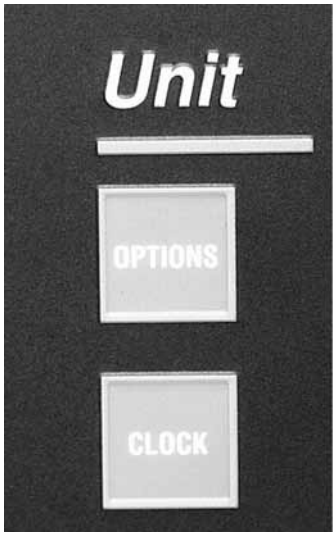
TABLE 21 – SETPOINTS QUICK REFERENCE LIST

"UNIT" KEYS



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OPTIONS KEY

There are many programmable options under the OPTIONS key. The OPTIONS key is used to scroll through the list of options by repeatedly pressing the OPTIONS key . After the selected option has been displayed, the UP and DOWN arrow keys are then used to change that particular option. After the option is changed, the ENTER/ADV key must be pressed to enter the data into memory. Table 22 shows the programmable options. Following are the displays in the order they appear:

OPTION 1 – LANGUAGE:

```
DISPLAY LANGUAGE
ENGLISH
```

English, Spanish, French, German, and Italian can be programmed.

OPTION 2 - SYSTEM SWITCHES: (two system units only) (Single System Display is similar)

```
SYS 1 SWITCH ON
SYS 2 SWITCH ON
```

This allows both systems to run
or

```
SYS 1 SWITCH ON
SYS 2 SWITCH OFF
```

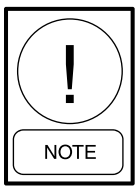
This turns system 2 off
or

```
SYS 1 SWITCH OFF
SYS 2 SWITCH ON
```

This turns system 1 off
or

```
SYS 1 SWITCH OFF
SYS 2 SWITCH OFF
```

This turns systems 1 & 2 off



Turning a system off with its system switch allows a pumpdown to be performed prior to shutdown.

OPTION 3 – AMBIENT CONTROL TYPE: (YCUL00016-00086 ONLY)

```
AMBIENT CONTROL
STANDARD
```

The low ambient cutout is adjustable from 25°F to 60°F (-3.9°C to 15.6°C).

or

```
AMBIENT CONTROL
LOW AMBIENT
```

The low ambient cutout is programmable down to 0°F (-17.8°C). **A low ambient kit MUST be installed for this option to be chosen. If the kit is NOT installed, and low ambient is selected, low pressure faults and compressor damage may occur. YCUL0096-0130 are fixed in the low ambient mode as standard and cannot be reprogrammed.**

OPTION 4 – LOCAL/REMOTE CONTROL TYPE:

```
LOCAL / REMOTE MODEL
LOCAL
```

When programmed for LOCAL, an ISN or RCC control can be used to monitor only. The micro panel will operate on locally programmed values and ignore all commands from the remote devices. The chiller will communicate and send data to the remote monitoring devices.

or

```
LOCAL/REMOTE MODE
REMOTE
```

This mode should be selected when an ISN or RCC control is to be used to control the chiller. This mode will allow the ISN to control the following items: Remote Start/Stop, Cooling Setpoint, Load Limit, and History Buffer Request. If the unit receives no valid ISN transmission for 5 minutes, it will revert back to the locally programmed values.

OPTION 6 – UNIT CONTROL MODE:

```
CONTROL MODE
SUCTION PRESSURE
```

Unit control is based on Suction Pressure Control.

or

```
CONTROL MODE
DISCHARGE AIR
```

Unit control is based on Discharge Air Temp. Control.

OPTION 6 – DISPLAY UNITS:

```
DISPLAY UNITS
IMPERIAL
```

This mode displays system operating values in Imperial units of °F or PSIG.

or

```
DISPLAY UNITS
SI
```

This mode displays system operating values in Scientific International Units of °C or BARG.

OPTION 7 - LEAD/LAG TYPE (two system units with Discharge Air Temp Control only):

```
LEAD/LAG CONTROL
MANUAL SYS 1 LEAD
```

SYS 1 selected as lead compressor. SYS 1 lead option MUST be chosen if Hot Gas Bypass is installed.

or

```
LEAD/LAG CONTROL
MANUAL SYS 2 LEAD
```

SYS 2 selected as lead compressor.

or

```
LEAD/LAG CONTROL
AUTOMATIC
```

Lead/lag between systems may be selected to help equalize average run hours between systems on chillers with 2 refrigerant systems. Auto lead/lag allows automatic lead/lag of the two systems based on an average run hours of the compressors in each system. A new lead/lag assignment is made whenever all compressors shut down. The micro will then assign the "lead" to the system with the shortest average run time.

OPTION 8 - CONDENSER FAN CONTROL MODE (YCUL0016-0086 Only):

```
FAN CONTROL
DISCHARGE PRESSURE
```

Condenser fans are controlled by discharge pressure only. This mode may only be chosen when discharge pressure transducers are installed. YCUL0096-0130 are fixed in the fan control by discharge pressure mode and cannot be reprogrammed.

or

```
FAN CONTROL
AMBIENT & DSCH PRESS
```

Condenser fans are controlled by ambient temperature and discharge pressure. This mode must be chosen if the discharge pressure transducers are **not** installed.

OPTION 9 – MANUAL OVERRIDE MODE:

```
MANUAL OVERRIDE MODE
DISABLED
```

This option allows overriding of the daily schedule that is programmed. MANUAL OVERRIDE MODE – DISABLED indicates that override mode has no effect.

or

```
MANUAL OVERRIDE MODE
ENABLED
```

Manual Override Mode is enabled. This is a service function and when enabled, will allow the unit to start when shut down on the daily schedule. It will automatically be disabled after 30 minutes.

OPTION 10 – CURRENT FEEDBACK OPTIONS INSTALLED:

```
CURRENT FEEDBACK
NONE
```

This mode should be selected when the panel is not equipped with current sensing capability.

or

```
CURRENT FEEDBACK
ONE PER UNIT
```

This mode should be selected when an optional 2ACE Module is installed to allow combined current monitoring of all systems by sensing current on the incoming line. Current input is to J8-5 of the micro.

or

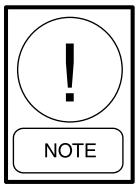
```
CURRENT FEEDBACK
ONE PER SYSTEM
```

This mode should be selected when an optional 2ACE module is installed to allow individual current monitoring of each system. SYS 1 input is to J8-5 of the micro. SYS 2 input is to J8-6 of the micro.

OPTION 11 – SOFT START ENABLE/DISABLE:

```
SOFT START
ENABLED
```

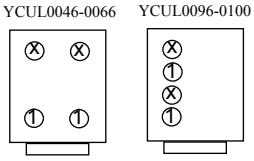
This should only be enabled on European units with soft start on 2 compressors. This feature modifies the compressor lead/lag to start the compressor(s) furthest from the control panel last to minimize current inrush. These compressors will be equipped with a soft starter.



Soft start is only viewable under OPTIONS key and must be programmed from the Service Mode.

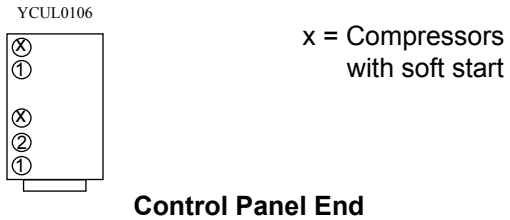
On 2 compressor chillers, soft start will always be applied to the compressor farthest from the control panel. This compressor will always start last to minimize current inrush with the other compressor running.

On 4 compressor chillers, soft start will always be applied to the compressor furthest from the control panel on each system. These compressors will always start last to minimize current inrush with the other compressors running.



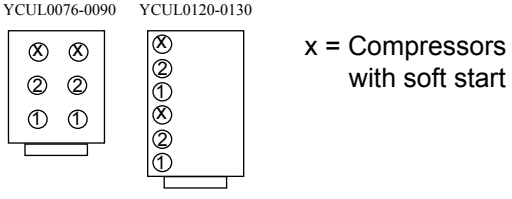
Control Panel End

On 5 compressor chillers, soft start will always be applied to the compressor furthest from the control panel on each system. Compressors 1 and 2 will continue to lead/lag per the selected option. The soft start compressors will always start last, to minimize current inrush with the other compressors running.



Control Panel End

On 6 compressor chillers, soft start will always be applied to the compressors farthest from the control panel on each system. Compressors 1 and 2 of each system will continue to lead/lag per the selected option. The soft start compressors will always start last to minimize current inrush with the other compressors running.



Control Panel End

```
SOFT START
DISABLED
```

This MUST be selected on all chillers without the soft start option.

OPTION 12 – UNIT TYPE:

```
UNIT TYPE
CONDENSING UNIT
```

The UNIT TYPE message cannot be modified under the unit keys.

"CONDENSING UNIT" must be displayed, or damage to compressors or other components will occur if operated in the HEAT PUMP or LIQUID CHILLER modes.

If unit type needs to be changed to make the unit a condensing unit, add a jumper between J4-6 and J4-11, of the microboard and reapply power to the micropanel.

OPTION 13 – REFRIGERANT TYPE:

```
REFRIGERANT TYPE
R-22
```

Refrigerant type R-22 or R-407C may be selected under Service Mode. Refrigerant type is displayed under the Options Key, but is only programmable in Service Mode.

Incorrect programming may cause damage to compressors.

OPTION 14 – EXPANSION VALVE TYPE:

```
EXPANSION VALVE TYPE
THERMOSTATIC
```

Expansion valve type, thermostatic or electronic may be selected under Service Mode. Expansion valve type is displayed under the Options key, but is only programmable in Service Mode.

Incorrect programming may cause damage to compressors. This must be programmed for "Thermostatic".

Also see the UNIT KEYS PROGRAMMING QUICK REFERENCE LIST in Table 22, Page 122.

CLOCK

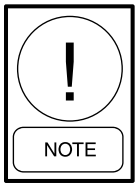
The CLOCK display shows the current day, time, and date. Pressing the CLOCK key will show the current day, time, and date.

It is important that the date and time be correct, otherwise the daily schedule will not function as desired if programmed. In addition, for ease of troubleshooting via the History printouts, the day, time, and date should be correct.

To change the day, time, and date press the CLOCK key. The display will show something similar to the following:

```
TODAY IS FRI 08:51AM
25 JAN 02
```

The line under the F is the cursor. If the day is correct, press the ENTER/ADV key. The cursor will move under the 0 in 08 hours. If the day is incorrect, press the UP or DOWN arrow keys until the desired day is displayed and then press the ENTER/ADV key at which time the day will be accepted and the cursor will move under the first digit of the "2 digit hour". In a similar manner, the hour, minute, meridian, month, day, and year may be programmed, whenever the cursor is under the first letter/numeral of the item. Press the UP or DOWN arrow keys until the desired hour, minute, meridian, day, month, and year are displayed. Pressing the ENTER/ ADV Key will save the valve and move the cursor on to the next programmable variable.

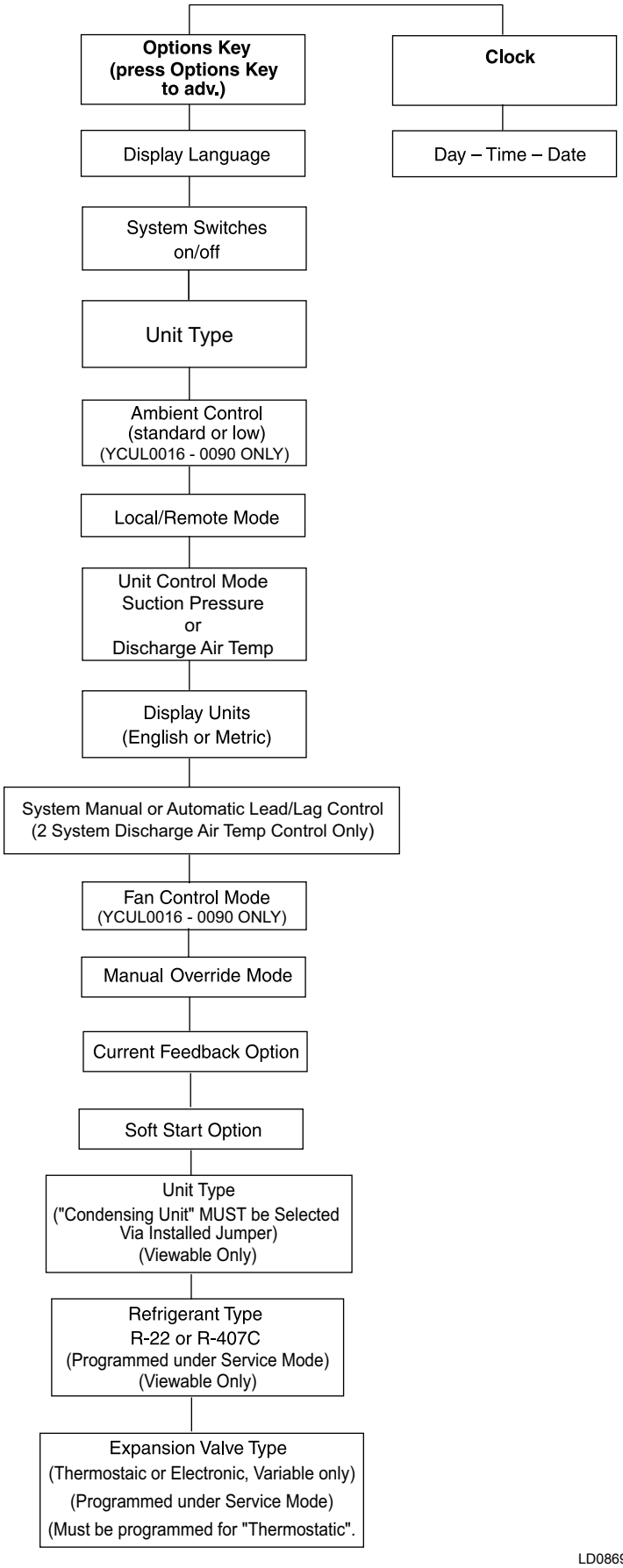


Jumper J11 on the microboard must be set to the "CLKON" position to turn on the clock. If this is not done, the clock will not function.

Table 22 provides a quick reference list for the Unit key setpoints.

TABLE 22 – UNIT KEYS PROGRAMMING QUICK REFERENCE LIST

Quick Reference Programming Chart
Unit Keys Section



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UNIT OPERATION

CAPACITY CONTROL

To initiate the start sequence of the unit, all run permissive inputs must be satisfied (air proving/remote start/stop switch), and no unit or system faults exist.

The first phase of the start sequence is initiated by the Daily Schedule Start or a Remote Cycling Device. If the unit is shut down on the daily schedule, the evaporator blower contacts (Terminals 23 and 24 of CTB2) will close when the daily schedule start time has been reached. Once the air proving switch closes, capacity control functions are initiated.

If unit cycling is accomplished with a remote cycling device wired in series with the air proving switch, the evaporator contacts will always be energized as long as the unit switch is turned on. When the air proving switch and remote cycling contacts are closed, the capacity control functions will be initiated.

It should be noted that the evaporator contacts (Terminals 23 and 24 of CTB2) are not required to be used to cycle the evaporator blower. However, in all cases the air proving switch must be closed to allow unit operation.

The control system will evaluate the need for cooling by comparing the actual discharge air temperature or suction pressure(s) to the desired setpoint, and regulate the discharge air temperature or suction pressure to meet that desired setpoint.

DISCHARGE AIR TEMPERATURE CONTROL

The setpoint in Discharge Air Temperature Control is the temperature the condensing unit will control to within +/- the control range. The setpoint High Limit is the Setpoint plus the Cooling Range. The Setpoint Low Limit is the Setpoint minus the Cooling Range. See Figure 16.

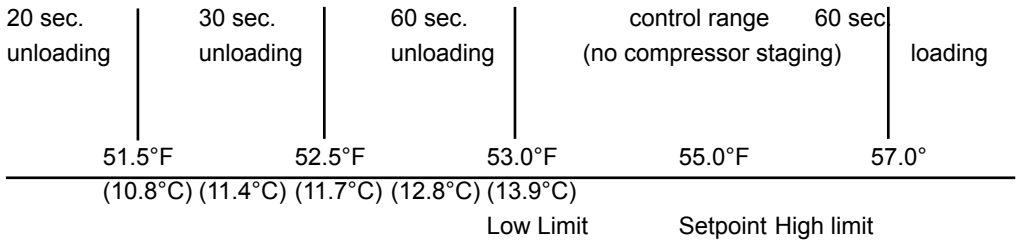
If the Discharge Air Temperature is above the Setpoint High Limit, the lead compressor on the lead system will be energized along with the liquid line solenoid. Upon energizing any compressor, the 60 second Anti-Coincidence timer will be initiated.

If after 180 seconds of run time the discharge air temperature is still above the Setpoint High Limit, the next compressor in sequence will be energized. Additional loading stages are energized at a rate of once every 180 seconds if the discharge air temperature remains above the Setpoint High Limit.

If the discharge air temperature falls below the Setpoint High Limit but is greater than the Setpoint Low Limit, loading and unloading do not occur. This area of control is called the control range.

If the discharge air temperature drops below the Setpoint Low Limit, unloading occurs at a rate of 60 seconds.

The sequences of Capacity Control (compressor staging) for loading and unloading are shown in Table 23 through Table 24.



Discharge Air Temperature Control – Compressor Staging
Setpoint = 55.0°F (12.8°C) Range = +/- 5°F (-12.2°C)

FIG. 16 – DISCHARGE AIR TEMPERATURE CONTROL

TABLE 23 – DISCHARGE AIR TEMPERATURE CONTROL FOR 5 AND 6 COMPRESSORS (7 AND 8 STEPS)

LEAD SYSTEM					LAG SYSTEM		
* STEP	COMP 1	COMP 2	COMP 3		COMP 1	COMP 2	COMP 3
0	OFF	OFF	OFF		OFF	OFF	OFF
1	ON+HG	OFF	OFF	SEE NOTE 1	OFF	OFF	OFF
2	ON	OFF	OFF		OFF	OFF	OFF
3	ON	OFF	OFF	SEE NOTE 2	ON	OFF	OFF
4	ON	ON	OFF	SEE NOTE 3	OFF	OFF	OFF
5	ON	ON	OFF		ON	OFF	OFF
6	ON	ON	OFF		ON	ON	OFF
7	ON	ON	ON		ON	ON	OFF
8	ON	ON	ON		ON	ON	ON

TABLE 24 – DISCHARGE AIR TEMPERATURE CONTROL FOR 4 COMPRESORS (6 STEPS)

LEAD SYSTEM					LAG SYSTEM	
* STEP		COMP 1	COMP 2		COMP 1	COMP 2
0	OFF	OFF		OFF	OFF	
1	ON+HG	OFF	SEE NOTE 1	OFF	OFF	
2	ON	OFF		OFF	OFF	
3	ON	OFF	SEE NOTE 2	ON	OFF	
4	ON	ON	SEE NOTE 3	OFF	OFF	
5	ON	ON		ON	OFF	
6	ON	ON		ON	ON	

* STEP can be viewed using the OPER DATA key and scrolling to COOLING DEMAND.

Notes:

1. Step 1 is Hot Gas Bypass and is skipped when loading occurs. Hot Gas Bypass operation is inhibited during Pumpdown. For Discharge Air Temperature Control the Hot Gas Bypass solenoid is energized only when the lead compressor is running and the DAT < SP, the Hot Gas Bypass solenoid is turned off when the DAT > SP + CR/2.
2. Step 3 is skipped when loading occurs.
3. Step 4 is skipped when unloading occurs.

   * STEP can be viewed using the OPER DATA key and scrolling to COOLING DEMAND.

TABLE 25 – DISCHARGE AIR TEMPERATURE CONTROL FOR 3 COMPRESSORS (SINGLE SYSTEM)

*STEP	COMP 1	COMP 2	COMP 3	
0 OFF	OFF	OFF		
1	ON+HG	OFF	OFF	SEE NOTE 1
2 ON	OFF	OFF		
3	ON	ON	OFF	
4	ON	ON	ON	

TABLE 26 – DISCHARGE AIR TEMPERATURE CONTROL FOR 2 COMPRESSORS (SINGLE SYSTEM)

*STEP	COMP 1	COMP 2	
0 OFF	OFF		
1	ON+HG	OFF	SEE NOTE 1
2 ON	OFF		
3	ON	ON	

* STEP can be viewed using the OPER DATA key and scrolling to COOLING DEMAND.

Notes:

1. Step 1 is Hot Gas Bypass and is skipped when loading occurs. Hot Gas Bypass operation is inhibited during Pumpdown. For Discharge Air Temperature Control the Hot Gas Bypass solenoid is energized only when the lead compressor is running and the DAT < SP, the Hot Gas Bypass solenoid is turned off when the DAT > SP + CR/2.
2. Step 3 is skipped when loading occurs.
3. Step 4 is skipped when unloading occurs.

SUCTION PRESSURE CONTROL

The setpoint in Suction Pressure Control is the suction pressures each individual system on the condensing unit will control to within +/- the cooling range. The Setpoint High Limit is the Setpoint plus the Cooling Range. The Setpoint Low Limit is the Setpoint minus the Cooling Range. Each system is controlled independently of each other according to its setpoint and cooling range.

Each system must have its own zone thermostat. If the respective zone thermostat is closed, the lead compressor on that system will be energized. In addition the liquid line solenoid to that system will be energized. Upon energizing any compressor the 60 second Anti-Coincidence timer will be initiated.

If after 150 seconds of run-time the suction pressure is still above the Setpoint High Limit, the next compressor in sequence will be energized. Additional loading stages are energized at a rate of once every 150 seconds if the suction pressure remains above the Setpoint High Limit. Each system will have its own load timer of 150 seconds.

If the suction pressure falls below the Setpoint High Limit and greater than the Setpoint Low Limit, loading and unloading do not occur. This area of control is called the control range.

If the suction pressure falls below the Setpoint Low Limit, unloading (compressors cycling off) occurs at a rate of 30 seconds per system. The zone thermostat must be satisfied before the last compressor in the system cycles off, even if the suction pressure is below the Setpoint Low Limit.

Hot Gas Bypass solenoid will be energized as the last stage of unloading. If the zone thermostat calls for cooling when the suction pressure is below the Setpoint Low Limit, the first stage compressor will be energized with the hot gas solenoid.

It should be noted that the zone thermostat has ultimate control. As long as the zone thermostat is calling for cooling, at least compressor will be running, regardless of whether the suction pressure is below Setpoint Low Limit.

Figure 17 illustrates loading and unloading in Suction Pressure Control Mode. Refer to section on Setpoints Keys for programmable values.

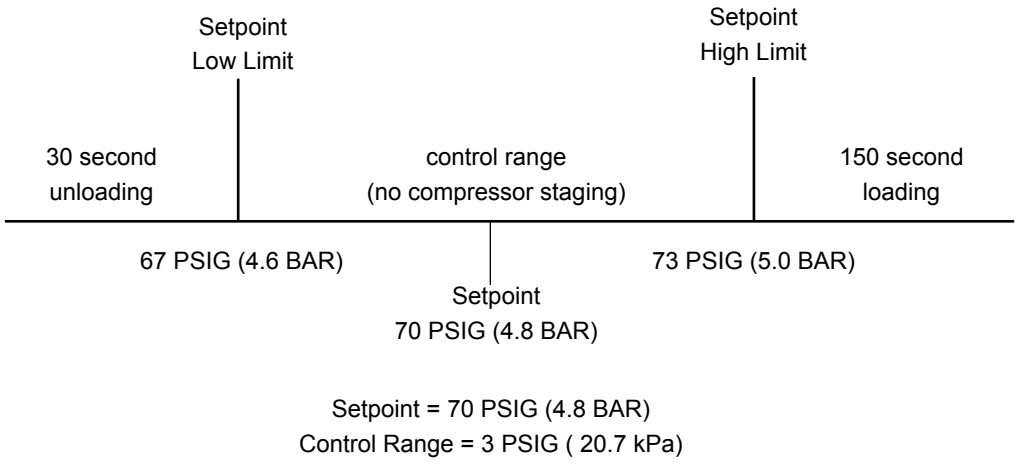


FIG. 17 – SUCTION PRESSURE CONTROL

SYSTEM LEAD/LAG
(Discharge Air Temp Control Only)

Lead/lag between systems may be selected to help equalize average run hours between systems on chillers with 2 refrigerant systems. This may be programmed under the OPTIONS key. Auto lead/lag allows automatic lead/lag of the two systems based on average run hours of the compressors in each system. Manual lead/lag selects specifically the sequence in which the micro starts systems. Systems in Suction Pressure Control act independently based on the individual Suction Pressure Control SETPOINTS.

COMPRESSOR LEAD/LAG

The compressors within a system rotate starts in sequence 1, 2 or 1, 2, 3 with wraparound. The longest-off compressor in a system will start first, and the longest-running compressor in a system will turn off first. When unloading, the system with the most compressors on, unloads first. The lag system will shut down a compressor first when equal numbers of compressors are operating in each system. The micro will not attempt to equalize run time of compressors in a system.

Once the second system has started a compressor, the micro will attempt to equally load each system. Once this occurs, loading will alternate between systems.

If Soft Start is enabled on European models with this option, compressor lead/lag will function as outlined in Option 12 under the Options key.

ANTI-RECYCLE TIMER

The programmable anti-recycle timer assures that systems do not cycle. This timer is programmable under the PROGRAM key between 300 - 600 seconds. Whenever possible, to reduce cycling and motor heating, the anti-recycle timer should be adjusted to 600 seconds. The programmable anti-recycle timer starts the timer when the first compressor in a system starts. The timer begins to count down. If all of the compressors in a circuit cycle off, a compressor within the circuit will not be permitted to start until the anti-recycle timer has timed out. If the lead system has run for less than 5 minutes, 3 times in a row, the anti-recycle timer will be extended to 10 minutes.

ANTI-COINCIDENCE TIMER

This timer is not present on single-system units. Two timing controls are present in software to assure compressors within a circuit or between systems, do not start simultaneously. The anti-coincidence timer assures there is at least a one minute delay between system starts on 2-circuit systems. This timer is NOT programmable. The load timers further assure that there is a minimum time between compressor starts within a system.

EVAPORATOR BLOWER CONTROL

The evaporator start contacts (CTB2 - terminals 23 - 24) are energized when any of the following conditions are true:

1. Any compressor is running
2. Daily Schedule is not programmed OFF and Unit Switch is ON.

The contacts will not close if the micropanel has been powered up for less than 30 seconds or if the contacts have been closed in the last 30 seconds to prevent motor overheating. These contacts can be used to start the evaporator blower and for all practical purposes, will be running in a “constant fan” mode. However, if the blower is desired to cycle with the compressors, then cycling of the evaporator blower can be achieved by using the “Run Contacts” located at CTB2 - terminals 25 to 26 for system 1, or CTB2 - terminals 27 to 28 for system two (if applicable).

PUMPDOWN CONTROL

Each system has a pump-down feature upon shut-off. Manual pumpdown from the keypad is possible by turning off the respective system’s switch under the OPTIONS key. On a non-safety, non-unit switch shutdown, all compressors but one in the system will be shut off. The LLSV will also be turned off. The final compressor will be allowed to run until the suction pressure falls below the cutout, or for 180 seconds, whichever comes first.
trols the EEV pilot solenoid portion of the valve and is 115VAC.

Program

The superheat setpoint is programmable under the Program key. Superheat may be programmed for 10°F to 15°F, with 12°F as the default. It is recommended that a 12°F to 15°F setpoint be used for most applications.

Safeties

Two safeties are associated with the EEV, the low superheat safety and the sensor fault safety. Details are outlined in the System Safeties section.

CONDENSER FAN CONTROL (YCUL0016 – YCUL0090 CHILLERS)

Condenser fan operation must be programmed with the Options key under "Fan Control." Condenser fan control can be selected for Ambient Temp. and Disch. Pressure, or Discharge Pressure Only.

The condenser fan control by "Ambient Temperature and Discharge Pressure" is a feature that is integral to the standard software control. If the optional discharge transducer is not installed, the condenser fans will operate based on outdoor ambient temperature only. See Table 27.

The condenser fan control by "Discharge Pressure" is a feature that can be selected if the discharge pressure transducer is installed and fan recycling is not a concern. Fan control by discharge pressure will operate according to Table 28. The fan control on-pressure and fan differential off-pressure are programmable under the PROGRAM key.

CONDENSER FAN CONTROL (YCUL0096 – YCUL0130)

YCUL0096 - YCUL0130 fan control will be by discharge pressure only. See Tables 30 - 32.

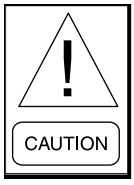
LOW AMBIENT CONDENSER FAN CONTROL (YCUL0016 – YCUL0090) (YCUL0096 – YCUL0130 always operate in Low Ambient Mode)

For unit operation below 25°F (-3.9°C) a low ambient kit is required. The kit consists of a discharge pressure transducer(s) and reversing contactors.

With the low ambient kit installed and the unit programmed for low ambient operation, the condenser fans will operate as shown in Tables 29 (YCUL0016 – YCUL0090) YCUL0096 – YCUL0130 is shown in Tables 30 - 31

Condenser fan operation in low ambient mode will be controlled by discharge pressure only.

The fan control on-pressure and the fan differential off-pressure are programmable under the PROGRAM key.



A low ambient kit MUST be installed when "AMBIENT CONTROL LOW AMBIENT" is selected under the OPTIONS key on YCUL0016 – YCUL0090.

Compressor damage could occur if programming does not match installed hardware.

CONDENSER FAN CONTROL - YCUL0016 – YCUL0090

TABLE 27 – YCUL0016 – YCUL0090 CONDENSER FAN CONTROL USING OUTDOOR AMBIENT TEMPERATURE AND DISCHARGE PRESSURE (DISCHARGE PRESSURE CONTROLS WILL NOT FUNCTION UNLESS THE OPTIONAL DISCHARGE PRESSURE TRANSDUCER IS INSTALLED)

FAN STAGE	ON	OFF	CONTACTOR		MICRO BOARD OUTPUT TB-4		FAN #	
			SYS 1	SYS 2	SYS 1	SYS 2	SYS 1	SYS 2
1 1 FAN FWD	OAT >25°F (-3.9°C) OR DP > Fan Ctrl On Press	OAT < 20°F (-6.7°C) AND DP < Fan Ctrl On Press – (Diff. Press.)	8M	11M	4	8	3	4
*3 2 FAN FWD	OAT >65°F (18.3°C) OR DP > Fan Ctrl On Press + 40 PSIG (2.76 Bars)	OAT < 60°F (15.6°C) AND DP < Fan Ctrl On Press – [Diff. Press + 40 PSIG (2.76 Bars)]	7M & 8M	10M & 11M	2 & 4	6 & 8	1 & 3	2 & 4

TABLE 28 – YCUL0016 – YCUL0090 CONDENSER FAN CONTROL USING DISCHARGE PRESSURE ONLY

FAN STAGE	ON	OFF	CONTACTOR		MICRO BOARD OUTPUT TB-4		FAN #	
			SYS 1	SYS 2	SYS 1	SYS 2	SYS 1	SYS 2
1 1 FAN FWD	DP > Fan Ctrl On Press	DP < Fan Ctrl On Press – (Diff. Press.)	8M	11M	4	8	3	4
*3 2 FANS FWD	DP > Fan Ctrl On Press + 40 PSIG (2.76 Bars)	DP < Fan Ctrl On Press – [(Diff. Press.) + 40 PSIG (2.76 Bars)]	7M & 8M	10M & 11M	2 & 4	6 & 8	1 & 3	2 & 4

*** NOTE:** STEP 2 is not active in the “Standard Ambient” mode. When changing to “Low Ambient” control, fan power wiring also changes.

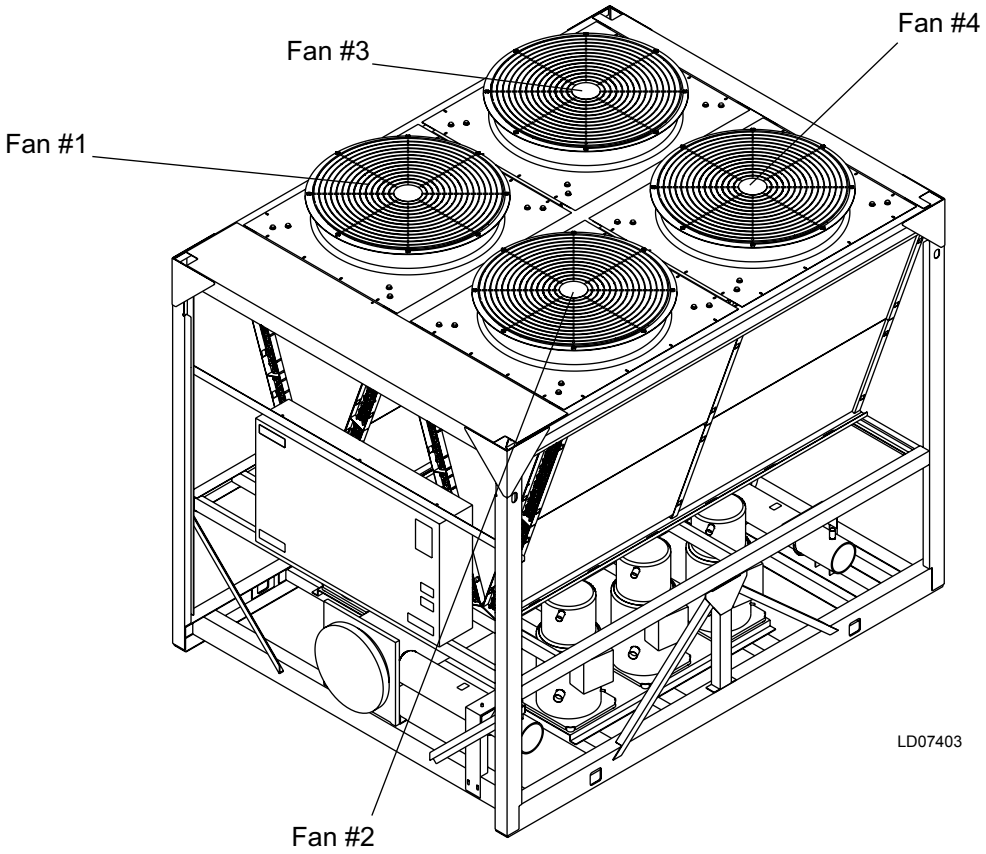
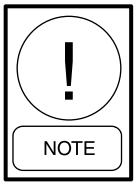


FIG. 18 – YCUL0016 – YCUL0090 FAN LOCATION (TYPICAL)

CONDENSER FAN CONTROL - YCUL0016 – YCUL0090

TABLE 29 – YCUL0016 - YCUL0090 LOW AMBIENT CONDENSER FAN CONTROL – DISCHARGE PRESSURE CONTROL

FAN STAGE	ON	OFF	CONTACTOR		MICRO BOARD OUTPUT TB-4		FAN #	
			SYS 1	SYS 2	SYS 1	SYS 2	SYS 1	SYS 2
1 1 FAN REV	DP > Fan Ctrl On Press.	DP < Fan Ctrl On Press. – Diff. Press.	7M	10M	2	6	1 REV	2 REV
2 1 FAN FWD	DP > Fan Ctrl On Press. + 20 PSIG (1.38 Bars)	DP < Fan Ctrl On Press. – [Diff. Press. + 20 PSIG (1.38 Bars)]	8M	11M	4	8	3 FWD	4 FWD
3 2 FANS FWD	DP > Fan Ctrl On Press. + 40 PSIG (2.76 Bars)	DP < Fan Ctrl On Press. – [Diff. Press. + 40 PSIG (2.76 Bars)]	8M & 9M	11M & 12M	4 & 5	8 & 9	1 & 3 FWD	2 & 4 FWD



When Low Ambient Control of the fans is selected, fan control will be by discharge pressure only.

CONDENSER FAN CONTROL - YCUL0096 – YCUL0130

CONDENSER FAN CONTROL (YCUL0096 – YCUL0130 CHILLERS)

Condenser fan control on models YCUL0096 – YCUL0130 will always be by discharge pressure. The on pressure and the differential off pressure are programmable under the PROGRAM key.

The following Figures and Tables outline fan sequencing for the various models. These models are equipped to operate to 0°F ambient as a standard.

TABLE 30 – YCUL0096 - YCUL00106 CONDENSER FAN CONTROL

FAN STAGE	ON	OFF	CONTACTOR		MICRO BOARD OUTPUT TB-4		FAN #	
			SYS 1	SYS 2	SYS 1	SYS 2	SYS 1	SYS 2
1 1 FAN FWD	DP > Fan Ctrl On Press	DP < Fan Ctrl On Press – (Diff. Press.)	9M	13M	2	6	5	6
2 2 FANS FWD	DP > Fan Ctrl On Press + 20 PSIG (1.38 Bars)	DP < Fan Ctrl On Press – [(Diff. Press.) + 20 PSIG (1.38 Bars)]	8M & 9M	12M & 13M	2 & 4	6 & 8	3 & 5	4 & 6
3 3 FANS FWD	DP > Fan Ctrl On Press + 40 PSIG (2.76 Bars)	DP < Fan Ctrl On Press – [(Diff. Press.) + 40 PSIG (2.76 Bars)]	7M, 8M, & 9M	11M, 12M & 13M	2, 4 & 5	6, 8 & 9	1, 3 & 5	2, 4 & 6

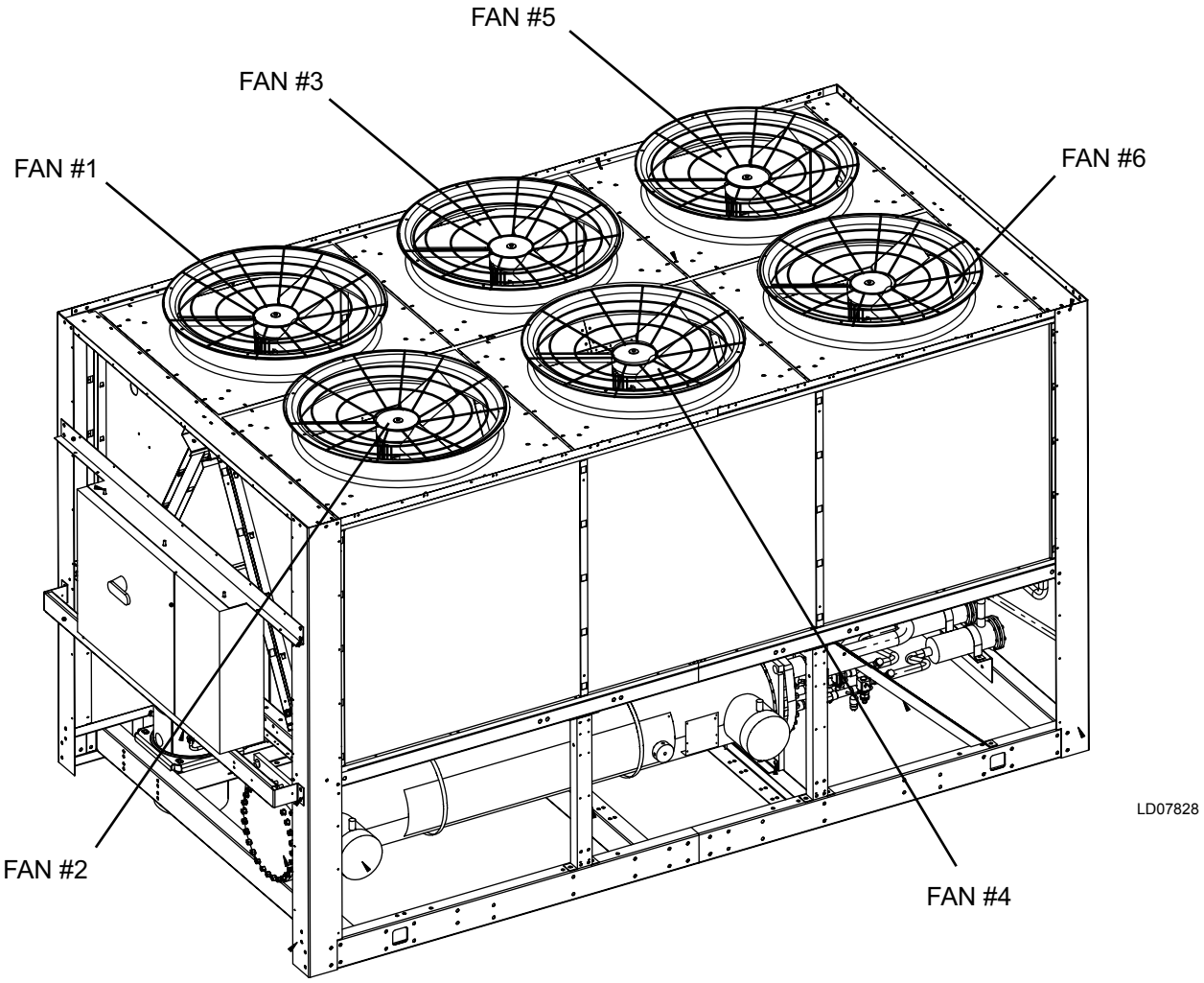


FIG. 19 – YCUL096 – YCUL0106 FAN LOCATION

CONDENSER FAN CONTROL - YCUL0120 – YCUL0130

TABLE 31 – YCUL0120 - YCUL0130 CONDENSER FAN CONTROL

FAN STAGE	ON	OFF	CONTACTOR		MICRO BOARD OUTPUT TB-4		FAN #	
			SYS 1	SYS 2	SYS 1	SYS 2	SYS 1	SYS 2
1 1 FAN FWD	DP > Fan Ctrl On Press	DP < Fan Ctrl On Press – (Diff. Press.)	10M	14M	2	6	7	8
2 2 FANS FWD	DP > Fan Ctrl On Press + 20 PSIG (1.38 Bars)	DP < Fan Ctrl On Press – [(Diff. Press.) + 20 PSIG (1.38 Bars)]	9M & 10M	13M & 14M	2 & 4	6 & 8	5 & 7	6 & 8
3 3 FANS FWD	DP > Fan Ctrl On Press + 40 PSIG (2.76 Bars)	DP < Fan Ctrl On Press – [(Diff. Press.) + 40 PSIG (2.76 Bars)]	7M, 8M, & 10M	11M, 12M & 14M	2 & 5	6 & 9	1, 3 & 7	2, 4 & 8
4 4 FANS FWD	DP > Fan Ctrl On Press + 60 PSIG (4.14 Bars)	DP < Fan Ctrl On Press – [(Diff. Press.) + 60 PSIG (4.14 Bars)]	7M, 8M, 9M, 10M	11M, 12M, 13M, 14M	2, 4 & 5	6, 8 & 9	1, 3 5, 7	2, 4 6, 8

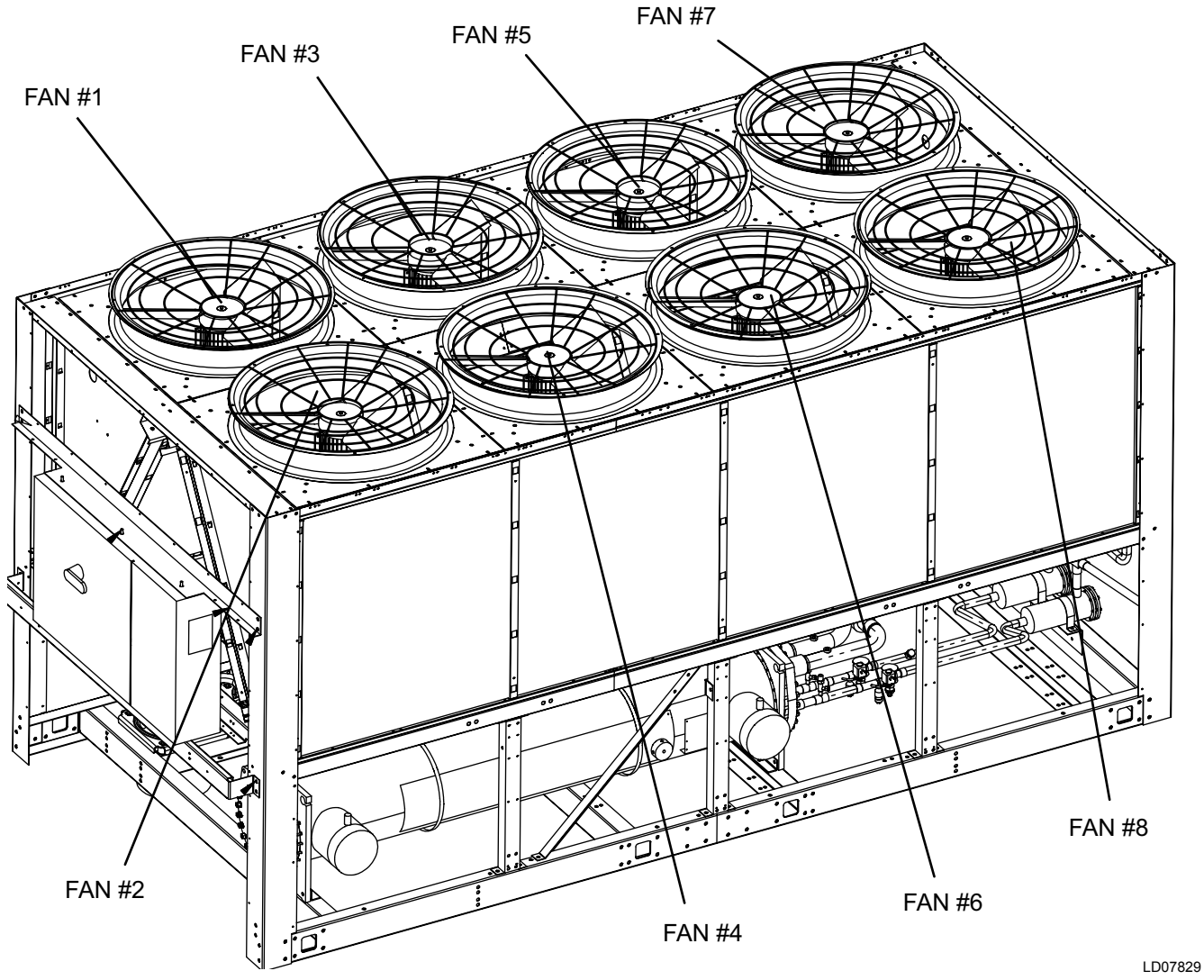


FIG. 20 – YCUL0120 – YCUL0130 FAN LOCATION

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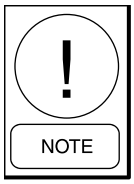
LOAD LIMITING

Load Limiting is a feature that prevents the unit from loading beyond the desired value. 2 and 4 compressor units can be load limited to 50%. This would allow only 1 compressor per system to run. 3 and 6 compressor units can be load limited to 33% or 66%. The 66% limit would allow up to 2 compressors per system to run, and the 33% limit would allow only 1 compressor per system to run. Five-compressor units may be load limited to 40% (1 compressor per system runs) or 80% (up to 2 compressors per system) are permitted to run. No other values of limiting are available.

There are two ways to load limit the unit. The first is through remote communication via an ISN.

A second way to load limit the unit is through closing contacts connected to the Load Limit (CTB1 – Terminals 13 - 21) and PWM inputs (CTB1 – Terminals 13 - 20). Stage 1 of load limiting involves closing the Load Limit input. Stage 2 of load limiting involves closing both the Load Limit and PWM inputs. The first stage of limiting is either 80%, 66% or 50%, depending on the number of compressors on the unit. The second stage of limiting is either 40% or 33% and is only available on 3, 5 & 6 compressor units. Table 32 shows the load limiting permitted for the various number of compressors.



Simultaneous operation of Load Limiting and EMS-PWM Temperature Reset (described on following pages) cannot occur.

COMPRESSOR RUN STATUS

Compressor run status is indicated by closure of contacts at CTB2 – terminals 25 to 26 for system 1 and CTB2 – terminals 27 to 28 for system 2. The respective contact will close anytime a compressor is running in that particular system.

The compressor Run Status contacts can also be used to cycle the evaporator fan contactor with the compressors.

ALARM STATUS

System or unit shutdown is indicated by normally-open contacts opening whenever the unit shuts down on a unit fault, or locks out on a system fault. System 1 alarm contacts are located at CTB2 - terminals 29 to 30. System 2 alarm contacts are located at CTB2 - terminals 31 to 32. The alarm contacts will close when conditions allow the unit to operate.

TABLE 32 – COMPRESSOR OPERATION – LOAD LIMITING

COMPRESSORS IN UNIT	STAGE 1	STAGE 2
2	50%	**–**
3	66%	33%
4	50%	**–**
5	80%	40%
6	66%	33%

EMS-PWM REMOTE TEMPERATURE RESET

EMS-PWM Remote Temperature Reset is a value that resets the Chilled Liquid Setpoint based on a PWM input (timed contact closure) to the microboard. This PWM input would typically be supplied by an Energy Management System.

A contact closure on the PWM Temp Reset input at CTB1 terminals 13 - 20, will reset the chilled liquid setpoint based on the length of time the contacts remain closed. The maximum temperature reset is achieved at a contact closure of 11 seconds. This is the longest contact closure time allowed. One second is the shortest time allowed and causes the Chilled Liquid Setpoint to revert back to the Local programmed value. The reset value is always added to the Chilled Liquid Setpoint, meaning that this function never lowers the Chilled Liquid Setpoint below the locally programmed value, it can only reset to a higher value. The microboard must be refreshed between 30 seconds and 30 minutes. Any contact closure occurring sooner than 30 seconds will be ignored. If more than 30 minutes elapse before the next contact closure, the setpoint will revert back to the locally programmed value. The new chilled liquid setpoint is calculated by the following equations:

$$\text{Setpoint} = \text{Local Discharge Air Temperature setpoint} + {}^\circ\text{reset}$$

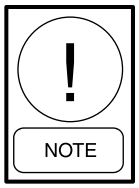
$$^\circ\text{Reset} = \frac{(\text{Contact Closure}) \times (\text{*Max. Reset Value})}{10}$$

Example:

Local Setpoint = 55°F (12.8°C).
*Max Reset Value = 10°F (5.6°C)
Contact Closure Time = 6 Seconds.

(English)
(6 sec. - 1) 10°F/10) = 5°F Reset
So...the new setpoint = 55°F + 5°F = 60°F. This can be viewed by pressing the Cooling Setpoints key twice. The new value will be displayed as "REM SETP = 60.0°F."

(Metric)
(6 sec - 1) * (5.6°C/10) = 2.8°C
Reset Cooling Setpoint = 12.8°C + 2.8°C = 15.6°C
So...the new reset Cooling Setpoint = 12.8 °C + 2.8 °C = 15.6 °C. This can be viewed by pressing the Cooling Setpoints key twice. The new value will be displayed as "REM SETP = 15.6 °C."



The temperature reset is only usable with the control mode set to discharge air temperature. It isnot available with the control mode programmed for suction pressure control.

BAS/EMS TEMPERATURE RESET OPTION

The Remote Reset Option allows the Control Center of the unit to reset the chilled liquid setpoint using a 0 - 10VDC input, a 4-20mA input, or a contact closure input. The Remote Reset circuit board converts the signals mentioned above into pulse width modulated (PWM) signals which the microprocessor can understand. Whenever a reset is called for, the change may be noted by pressing the Cooling Setpoints key twice. The new value will be displayed as "REM SETP = XXX°F."

The optional Remote Reset option would be used when reset of the chilled liquid setpoint is required and a PWM signal (timed contact closure) cannot be supplied by an Energy Management System. The Remote Temp. Reset Board will convert a voltage, current, or contact signal that is available from an EMS to a PWM signal, and every 80 seconds provide a PWM input to the microboard. Figure 21 shows a diagram of the field and factory electrical connections.

If a **0 - 10VDC** signal is available, it is applied to terminals A+ and A-, and **jumpers are applied to JU4 and JU2** on the reset board. This DC signal is conditioned to a 1 - 11 second PWM output and supplied to the PWM input on the microboard at CTB1 terminals 13 - 20. To calculate the reset chilled liquid setpoint for values between 0VDC and 10VDC use the following formula:

setpoint = local chilled liquid setpoint + °reset

$$^\circ\text{reset} = \frac{(\text{DC voltage signal}) \times (\text{*Max Reset Value})}{10}$$

Example:
Local Chilled Liquid Setpoint = 45°F (7.22°C)
*Max Reset Value = 20°F (11.11°C)
Input Signal = 6VDC

(English)

$$^\circ\text{reset} = \frac{6\text{VDC} \times 20^\circ\text{F}}{10} = 12^\circ\text{F reset}$$

Setpoint = 45°F + 12°F = 57°F

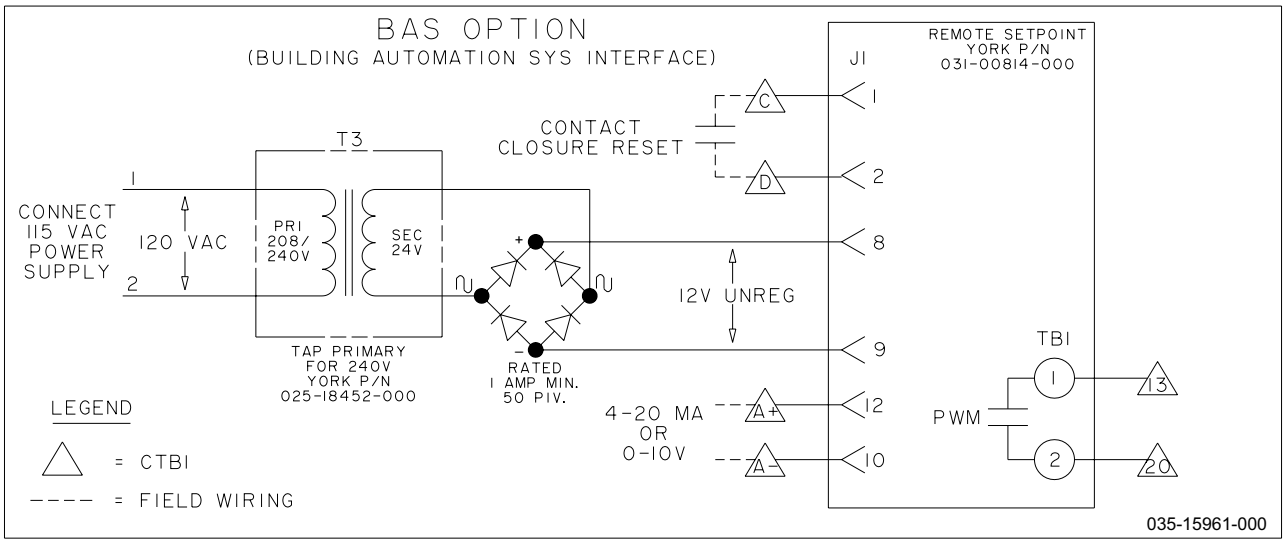


FIG. 21 – FIELD AND FACTORY ELECTRICAL CONNECTIONS
OPTIONAL REMOTE TEMPERATURE RESET BOARD

LD03875

(Metric)

°reset = $\frac{6VDC \times 11.1°C}{10}$ = 6.6°C reset

setpoint = 12.8°C + 6.6°C = 19.4°C

* Max Reset Value is the "Max EMS-PWM Remote Temp. Reset"setpoint values described in the programming section under Cooling Setpoints. Programmable values are from 2°F to 40°F (1.1°C to 22.2°C.)

If a **4-20mA signal is available,** it is applied to terminals A+ and A- and **jumpers are applied to JU5 and JU3** on the reset board. The mA signal is conditioned to a 1 - 11 second PWM output. The PWM output is then supplied to the PWM input on the microboard at CTB1 terminals 13 - 20. To calculate the chilled liquid setpoint for values between 4mA and 20 mA use the following formula:

setpoint = local chilled liquid setpoint + °reset

°reset = $\frac{(mA\ signal - 4) \times (*Max\ Reset\ Value)}{16}$

Example:

Local Chilled Liquid Setpoint = 45° (7.22°C)
*Max Reset Value = 10°F (5.56°C)
Input Signal = 12 mA

(English)

°reset = $\frac{8mA \times 10°F}{16}$ = 5°F reset

setpoint = 45°F + 5°F = 50°F

(Metric)

°reset = $\frac{8mA \times 5.6°C}{16}$ = 2.8°C reset

setpoint = 7.22°C + 2.78°C = 10.0°C

* Max Reset Value is the "Max EMS-PWM Remote Temp. Reset"setpoint values described in the programming section under Cooling Setpoints. Programmable values are from 2°F to 40°F (1.1°C to 22.2°C.)

NOTE

A 240-24 Volt Ratio Transformer (T3) is used to derive nominal 12 volt output from the 120 volt supply to power the remote reset circuit board.

If the **Contact Closure input** is used, the connections are made to terminals C and D and only **jumper JUI must be in place** on the reset board. This input is used when a *single* reset value is needed. When the contacts are closed, the remote temperature reset board will convert this contact closure to a PWM signal that is applied to CTB1 terminals 13 - 20.

To set the PWM output, the contacts must be closed on inputs C - D, and potentiometer R11 (located on the front edge of the PC board) is adjusted to 10VDC as measured at TP3 to terminal 10 on the circuit board. The reset value will be the "Max EMS-PWM Remote Temp. Reset" setpoint value programmed in the SETPOINTS section under the Cooling Setpoints key.

NOTE

The coil of any added relay used for reset must be suppressed to prevent possible component damage. Use YORK P/N 031-00808-000 suppressor.

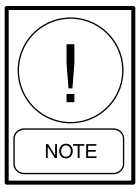
SERVICE AND TROUBLESHOOTING

CLEARING HISTORY BUFFERS

The history buffers may be cleared by pressing the HISTORY key and then repeatedly pressing the UP arrow key until you scroll past the last history buffer choice. The following message will be displayed:

```
INITIALIZE  HISTORY
ENTER = YES
```

Pressing the ENTER/ADV key at this display will cause the history buffers to be cleared. Pressing any other key will cancel the operation.



DO NOT CLEAR BUFFERS. Important information may be lost. Contact factory service.

SOFTWARE VERSION

The software version may be viewed by pressing the HISTORY key and then repeatedly pressing the DOWN arrow key until you scroll past the first history buffer choice. The following message is an example of what will be displayed:

```
SOFTWARE VERSION
C.MMC.01.01
```

SERVICE MODE

Service Mode is a mode that allows the user to enable or disable all of the outputs (except compressors) on the unit, change chiller configuration setup parameters and view all the inputs to the microboard.

To enter Service Mode, turn the unit switch off and press the following keys in the sequence shown; PROGRAM, UP ARROW, UP ARROW, DOWN ARROW, DOWN ARROW, ENTER. Service Mode will time out after 30 minutes and return to normal control mode, if the panel is accidentally left in this mode. Otherwise, turning the unit switch on will take the panel out of Service Mode.

SERVICE MODE – OUTPUTS

After pressing the key sequence as described, the control will enter Service Mode permitting the *outputs (except compressors), operating hours, refrigerant type, expansion valve type, and start/hour counters* to be viewed/modified. The ENTER/ADV key is used to advance through the outputs. Using the UP/DOWN ARROW keys will turn the respective digital output on/off or modify the value.

Following is the order of outputs that will appear as the ENTER/ADV key is pressed:

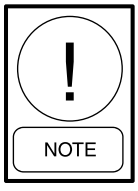
SYS 1 COMP 1 STATUS TB3-2 IS:
SYS 1 LLSV STATUS TB3-3 IS:
SYS 1 COMP 2 STATUS TB3-4 IS:
SYS 1 COMP 3 STATUS TB3-5 IS:
SYS 1 HGBP STATUS TB3-6 IS:
SYS 2 COMP 1 STATUS TB3-8 IS:
SYS 2 LLSV STATUS TB3-9 IS:
SYS 2 COMP 2 STATUS TB3-10 IS:
SYS 2 COMP 3 STATUS TB4-1 IS:
SYS 1 FAN OUTPUT 1 TB4-2 IS:
SYS 1 FAN OUTPUT 2 TB4-4 IS:
SYS 1 FAN OUTPUT 3 TB4-5 IS:
SYS 2 FAN OUTPUT 1 TB4-6 IS:
SYS 2 FAN OUTPUT 2 TB4-8 IS:
SYS 2 FAN OUTPUT 3 TB4-9 IS:
SYS 1 ALARM STATUS TB5-1 IS:
SYS 2 ALARM STATUS TB5-2 IS:
EVAP PUMP STATUS TB5-3 IS:
ANALOG OUTPUT 3 J10 - 5, 6 = :
ANALOG OUTPUT 4 J10 - 7, 8 = :

Each display will also show the output connection on the microboard for the respective output status shown. For example:

```
SYS 1 LLSV STATUS
TB3-2 IS OFF
```

This display indicates that the system 1 liquid line solenoid valve is OFF, and the output connection from the microboard is coming from terminal block 3 - pin 2.

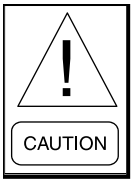
Pressing the UP Arrow key will energize the liquid line solenoid valve and OFF will change to ON in the display as the LLSV is energized.



It should be noted that some of the outputs, such as Evaporator Heater only apply to units configured as chillers and do not apply to condensing units.

SERVICE MODE – CHILLER CONFIGURATION

After the Outputs are displayed, the next group of displays relate to chiller configuration and start/hour counters. Data logging, soft start, refrigerant type, and expansion valve type all must be programmed to match actual chiller configuration.



Soft start, Refrigerant Type, and Expansion Valve Type MUST be properly programmed or damage to compressors and other system components may result.

Following is a list, in order of appearance:

DATA LOGGING MODE = : DO NOT MODIFY
DATA LOGGING TIMER = : DO NOT MODIFY
SOFT START
REFRIGERANT TYPE
EXPANSION VALVE TYPE
SYS 1 HOURS
SYS 2 HOURS
SYS 1 STARTS
SYS 2 STARTS

The last displays shown on the above list is for the accumulated run and start timers for each system. All values can also be changed using the UP and Down ARROW keys, but under normal circumstances would not be advised. After the last start display, the micro will display the first programmable value under the PROGRAM key.

SERVICE MODE – INPUTS

After entering Service Mode (PROGRAM ↑↑ ↓↓), *all digital and analog inputs to the microboard can be viewed by pressing the OPER DATA key.* After pressing the OPER DATA key, the UP ARROW and DOWN ARROW keys are used to scroll through the analog and digital inputs.

Following is the order of analog and digital inputs that will appear when sequenced with the ↓ (Down) ARROW key:
(analog inputs)

SYS 1 *SUCT PRESSURE
UNIT TYPE
SYS 1 **DISCH PRESSURE
SYS 1*** SUCTION TEMP. SENSOR
SYS 2*** SUCTION TEMP. SENSOR
SYS 1**** SUCTION TEMP. SENSOR
SYS 2**** SUCTION TEMP. SENSOR
AMBIENT AIR TEMP.
LEAVING LIQUID TEMP.
DISCHARGE AIR TEMP.
SYS 2 *SUCTION PRESSURE
SYS 2 SPARE
SYS 2 **DISCH PRESSURE
SYS 1 MTR VOLTS
SYS 2 MTR VOLTS

(digital inputs)

PWM TEMP RESET INPUT
LOAD LIMIT INPUT
FLOW SW / REM START
SPARE
SINGLE SYSTEM SELECT
SYS 1 MP / HPCO INPUT
SYS 2 MP / HPCO INPUT

* The suction pressure transducer is optional on YCUL0016 - YCUL0080. A low pressure switch is standard on these models in place of the suction transducer.

** The discharge pressure transducer is optional on some models.

*** Optional on Condensing Units only.

****The suction temp. sensor is on EEV units only.

The analog inputs will display the input connection, the temperature or pressure, and corresponding input voltage such as:

```
SYS 1 SUCT PR J4-10
2.1 VDC = 81 PSIG
```

This example indicates that the system 1 suction pressure input is connected to plug 4 - pin 10 (J4-10) on the microboard. It indicates that the voltage is 2.1 volts dc which corresponds to 81 PSIG (5.6 bars) suction pressure.

The digital inputs will display the input connection and ON/OFF status such as:

```
FLOW SW/REM START
J9-5 IS ON
```

This indicates that the flow switch/remote start input is connected to plug 9- pin 5 (J9-5) on the microboard, and is ON (ON = +30VDC unregulated input, OFF = 0VDC input on digital inputs).

CONTROL INPUTS/OUTPUTS

Tables 33 through 36 are a quick reference list providing the connection points and a description of the inputs and outputs respectively. All input and output connections pertain to the connections at the microboard.

Figure 22 illustrates the physical connections on the microboard.

TABLE 33 – MICROBOARD DIGITAL INPUTS

***J9-1**	30VDC UNREGULATED SUPPLY
J9-2	UNIT ON/OFF SWITCH
J9-3	PWM TEMP RESET OR LOAD LIMIT STAGE 2 ON 3, 5 & 6 COMP UNITS
J9-4	LOAD LIMIT STAGE 1
J9-5	SYS 1 ZONE THERMOSTAT AND REMOTE START / STOP
J9-6	SYS 2 ZONE THERMOSTAT AND REMOTE START / STOP
J9-7	SINGLE SYSTEM SELECT (JUMPER = SINGLE SYS, NO JUMPER=TWO SYS)
J9-8	CR1 (SYS 1 MOTOR PROTECTOR / HIGH PRESS CUTOUT)
J9-9	CR2 (SYS 2 MOTOR PROTECTOR / HIGH PRESS CUTOUT)

TABLE 34 – MICROBOARD ANALOG INPUTS

J4-10	SYS 1 SUCTION PRESS TRANSDUCER **OR** SYS 1 LOW PRESS SWITCH
J4-11	UNIT TYPE: CHILLER = NO JUMPER J4-6 TO J4-11 YCUL CONDENSING UNIT = JUMPER J4-6 TO J4-11
J4-12	SYS 1 DISCHARGE PRESSURE TRANSDUCER (OPTIONAL)
J5-11	SPARE
J5-12	SYS 1 SUCTION TEMP SENSOR COND UNITS
J5-13	SYS 2 SUCTION TEMP SENSOR COND UNITS
J5-14	SYS 1 SUCTION TEMP SENSOR (EEV OPTION)
J5-15	SYS 2 SUCTION TEMP SENSOR (EEV OPTION)
J6-7	AMBIENT AIR TEMPERATURE SENSOR
J6-8	LEAVING CHILLED LIQUID TEMPERATURE SENSOR
J6-9	DISCHARGE AIR
J7-10	SYS 2 SUCTION PRESSURE TRANSDUCER **OR** SYS 2 LOW PRESSURE SWITCH
J7-11	SPARE
J7-12	SYS 2 DISCHARGE PRESSURE TRANSDUCER (optional)
J8-5	UNIT/SYS 1 VOLTAGE
J8-6	SYS 2 VOLTAGE

TABLE 35 – MICROBOARD DIGITAL OUTPUTS

TB3-2	SYS 1 COMPRESSOR 1
TB3-3	SYS 1 LIQUID LINE SOLENOID VALVE OR EEV PILOT SOLENOID
TB3-4	SYS 1 COMPRESSOR 2
TB3-5	SYS 1 COMPRESSOR 3
TB3-6	SYS 1 HOT GAS BYPASS VALVE
TB3-8	SYS 2 COMPRESSOR 1
TB3-9	SYS 2 LIQUID LINE SOLENOID VALVE OR EEV PILOT SOLENOID
TB3-10	SYS 2 COMPRESSOR 2
TB4-1	SYS 2 COMPRESSOR 3
TB4-2	SYS 1 CONDENSER FAN OUTPUT 1
TB4-4	SYS 1 CONDENSER FAN OUTPUT 2
TB4-5	SYS 1 CONDENSER FAN OUTPUT 3
TB4-6	SYS 2 CONDENSER FAN OUTPUT 1
TB4-8	SYS 2 CONDENSER FAN OUTPUT 2
TB4-9	SYS 2 CONDENSER FAN OUTPUT 3
TB4-10	EVAPORATOR HEATER
TB5-1	SYS 1 ALARM
TB5-2	SYS 2 ALARM
TB5-3	EVAPORATOR PUMP / BLOWER STARTER

TABLE 36 – MICROBOARD ANALOG OUTPUTS

J10-1/J10-2	SYS 1 EEV OUTPUT
J10-3/J10-4	SYS 2 EEV OUTPUT
J10-5/J10-6	SPARE
J10-7/J10-8	SPARE

3

* The 30 dc unregulated supply is not an input. This voltage originates on the microboard and is used to supply the contacts for the digital inputs.

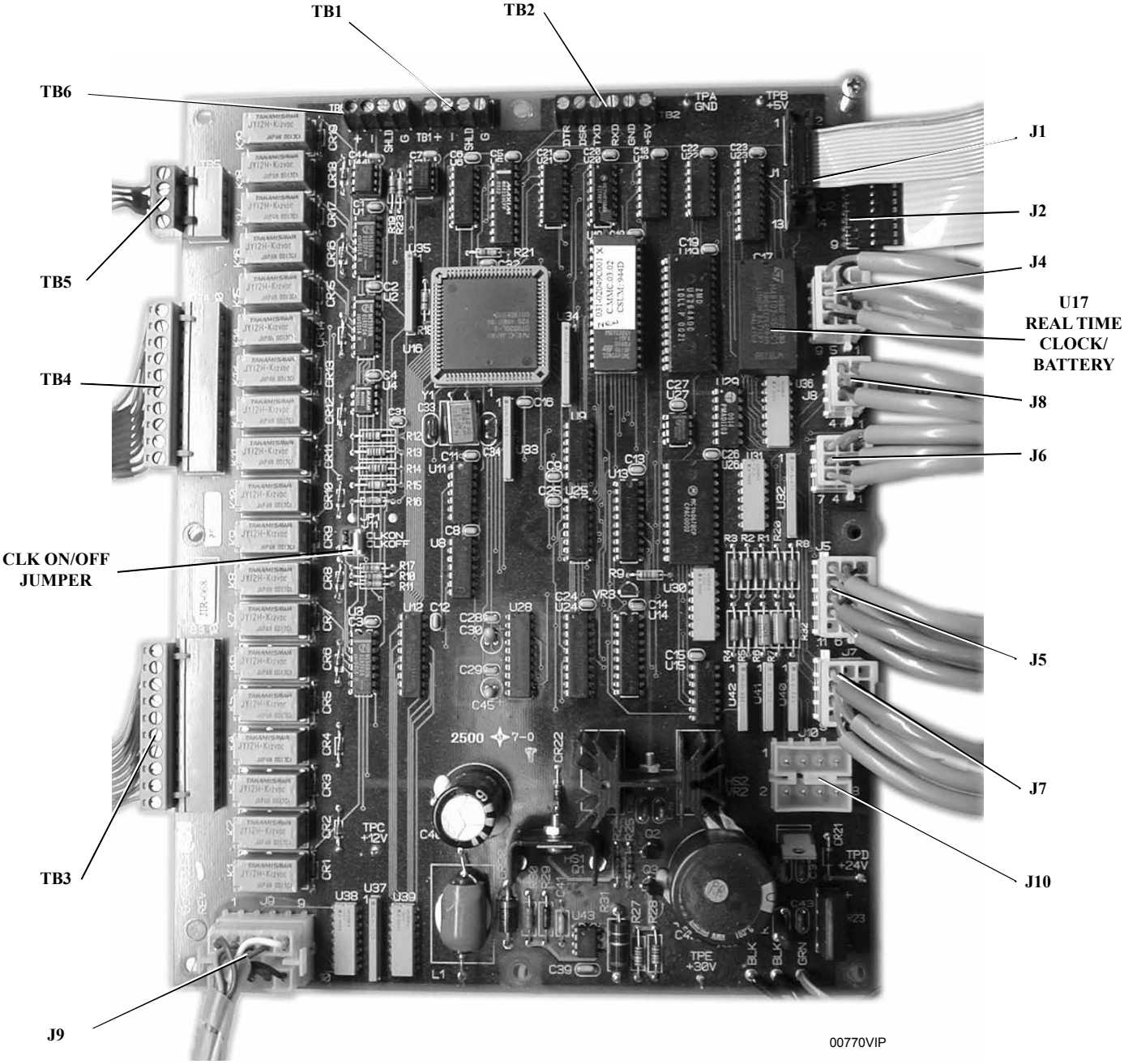


FIG. 22 – MICROBOARD LAYOUT

CHECKING INPUTS AND OUTPUTS

DIGITAL INPUTS

Refer to the unit wiring diagram. All digital inputs are connected to J9 of the microboard. The term "digital" refers to two states – either on or off. As an example, when the flow switch is closed, 30 volts ***DC*** will be applied to J9, pin 5 (J9-5) of the microboard. If the flow switch is open, 0 volts DC will then be present at J9-5.

Pin 1 of J9 is an *unregulated* 30VDC that is the ***DC*** voltage ***source*** used to supply the DC voltage to the various contacts, unit switch, flow switch, etc. This DC source is factory wired to CTB1, terminal 13. Any switch or contact used as a digital input would be connected to this terminal, with the other end connecting to its respective digital input on the microboard. Any time a switch or contact is closed, 30VDC would be applied to that particular digital input. Any time a switch or contact is open, 0VDC would be applied to that particular digital input.

Typically, as high as 34VDC could be measured for the DC voltage on the digital inputs. This voltage is in reference to ground. The unit case should be sufficient as a reference point when measuring digital input voltages.

ANALOG INPUTS – Temperature

Refer to the unit wiring diagram. Temperature inputs are connected to the microboard on plug J6. These ***analog*** inputs represent varying DC signals corresponding to varying temperatures. All voltages are in reference to the unit case (ground). Following are the connections for the temperature sensing inputs:

Outside Air Sensor

J6-4 = +5VDC regulated supply to sensor.
J6-7 = VDC input signal to the microboard. See Table 45 for voltage readings that correspond to specific outdoor temperatures.
J6-1 = drain (shield connection = 0VDC)

TABLE 37 – OUTDOOR AIR SENSOR TEMPERATURE/VOLTAGE/ RESISTANCE CORRELATION

TEMP °F	VOLTAGE	RESISTANCE	TEMP C°
0	0.7	85398	-18
5	0.8	72950	-15
10	0.9	62495	-12
15	1.0	53685	-9
20	1.1	46240	-7
25	1.2	39929	-4
30	1.4	34565	-1
35	1.5	29998	2
40	1.7	26099	4
45	1.8	22673	7
50	2.0	19900	10
55	2.2	17453	13
60	2.3	15309	16
65	2.5	13472	18
70	2.6	11881	21
75	2.8	10501	24
80	2.9	9298	27
85	3.1	8250	29
90	3.2	7332	32
95	3.4	6530	35
100	3.5	5827	38
105	3.6	5209	41
110	3.7	4665	43
115	3.8	4184	46
120	3.9	3759	49
125	4.0	3382	52
130	4.1	3048	54

TABLE 38 – DISCHARGE AIR TEMP. SENSOR TEMPERATURE/VOLTAGE/ RESISTANCE CORRELATION

TEMP °F	VOLTAGE	RESISTANCE	TEMP °C
0	1.71	25619	-18
2	1.78	24046	-17
4	1.85	22580	-16
6	1.93	21214	-14
8	2.00	19939	-13
10	2.07	18749	-12
12	2.15	17637	-11
14	2.22	16599	-10
16	2.30	15629	-9
18	2.37	14721	-8
20	2.45	13872	-7
22	2.52	13077	-6
24	2.59	12333	-4
26	2.67	11636	-3
28	2.74	10982	-2
30	2.81	10370	-1
32	2.88	9795	0
34	2.95	9256	1
36	3.02	8750	2
38	3.08	8276	3
40	3.15	7830	4
42	3.21	7411	6
44	3.27	7017	7
46	3.33	6647	8
48	3.39	6298	9
50	3.45	5970	10
52	3.51	5661	11
54	3.56	5370	12
56	3.61	5096	13
58	3.67	4837	14
60	3.72	4593	16
62	3.76	4363	17
64	3.81	4145	18
66	3.86	3941	19
68	3.90	3747	20
70	3.94	3564	21
72	3.98	3392	22
74	4.02	3228	23
76	4.06	3074	24
78	4.10	2928	26
80	4.13	2790	27

DISCHARGE AIR TEMPERATURE SENSOR

J6-6 = +5 VDC regulated supply to sensor.
J6-9 = VDC input signal to the microboard. See Table 39 for voltage readings that correspond to specific discharge temperatures.
J6-3 = drain (shield connection = 0 VDC)

TABLE 38 – SUCTION TEMP. SENSOR TEMPERATURE/VOLTAGE/ RESISTANCE CORRELATION

TEMP °F	VOLTAGE	RESISTANCE	TEMP °C
0	1.71	25619	-18
2	1.78	24046	-17
4	1.85	22580	-16
6	1.93	21214	-14
8	2.00	19939	-13
10	2.07	18749	-12
12	2.15	17637	-11
14	2.22	16599	-10
16	2.30	15629	-9
18	2.37	14721	-8
20	2.45	13872	-7
22	2.52	13077	-6
24	2.59	12333	-4
26	2.67	11636	-3
28	2.74	10982	-2
30	2.81	10370	-1
32	2.88	9795	0
34	2.95	9256	1
36	3.02	8750	2
38	3.08	8276	3
40	3.15	7830	4
42	3.21	7411	6
44	3.27	7017	7
46	3.33	6647	8
48	3.39	6298	9
50	3.45	5970	10
52	3.51	5661	11
54	3.56	5370	12
56	3.61	5096	13
58	3.67	4837	14
60	3.72	4593	16
62	3.76	4363	17
64	3.81	4145	18
66	3.86	3941	19
68	3.90	3747	20
70	3.94	3564	21
72	3.98	3392	22
74	4.02	3228	23
76	4.06	3074	24
78	4.10	2928	26
80	4.13	2790	27

Suction Temperature Sensor - System 1

J5-7 = +5 VDC regulated supply to sensor.
J5-12 = VDC input signal to the microboard. See Table 40 for voltage readings that correspond to specific suction temperatures.
J5-1 = drain (shield connection = 0 VDC)

Suction Temperature Sensor - System 2

J5-8 = +5 VDC regulated supply to sensor.
J5-13 = VDC input signal to the microboard. See Table 40 for voltage readings that correspond to specific suction temperatures.
J5-2 = drain (shield connection = 0 VDC)

ANALOG INPUTS – Pressure

Refer to the unit wiring diagram. Pressure inputs are connected to the microboard on plugs J4 and J7. These ***analog*** inputs represent varying dc signals corresponding to varying pressures. All voltages are in reference to the unit case (ground).

System 1 discharge and suction pressures will be connected to J4 of the microboard. System 2 discharge and suction pressure transducers will be connected to J7 of the microboard.

The discharge transducers are optional on all units except the YCUL0096 – YCUL0130. If the discharge transducers are not installed, no connections are made to the microboard and the discharge pressure readout on the display would be zero.

The suction pressure transducers are optional on YCUL0016 - YCUL0066. If the suction transducers are not installed, a mechanical low pressure switch will be installed in its place, and the suction pressure readout on the display will be 0 PSIG when the LP switch is open, and 200 PSIG (13.79 BARG) when the LP switch is closed.

The discharge transducers have a range from 0 to 400 PSIG. The output will be linear from .5VDC to 4.5VDC over the 400 PSIG (27.5 BARG) range. Following is the formula that can be used to verify the voltage output of the transducer. All voltage reading are in reference to ground (unit case).

V = (Pressure in PSIG x .01) + .5
or
V = (Pressure in BARG x .145) + .5

where V = dc voltage output
Pressure = pressure sensed by transducer

The microboard connections for the Discharge Transducers:

System 1 Discharge Transducer

J4-7 = +5VDC regulated supply to transducer.
J4-12 = VDC input signal to the microboard. See the formula above for voltage readings that correspond to specific discharge pressures.
J4-8 = +5VDC return
J4-9 = drain (shield connection = 0VDC)

System 2 Discharge Transducer

J7-7 = +5VDC regulated supply to transducer.
J7-12 = VDC input signal to the microboard. See the formula above for voltage readings that cor respond to specific discharge pressures.
J7-8 = +5VDC return
J7-9 = drain (shield connection = 0VDC)

The suction transducers have a range from 0 to 200 PSIG (13.79 BARG). The output will be linear from .5VDC to 4.5VDC over the 200 PSIG (13.79 BARG) range. Following is a formula that can be used to verify the voltage output of the transducer. All voltage reading are in reference to ground (unit case).

V = (Pressure in PSIG x .02) + .5
or
V = (Pressure in BARG x .29) + .5

where V = dc voltage input to micro
Pressure = pressure sensed by transducer

Following are the microboard connections for the Suction Transducer:

System 1 Suction Transducer

J4-5 = +5VDC regulated supply to transducer.
J4-10 = VDC input signal to the microboard. See the formula above for voltage readings that correspond to specific suction pressures.
J4-1 = +5VDC return
J4-2 = drain (shield connection = 0VDC)

System 2 Suction Transducer

J7-5 = +5VDC regulated supply to transducer.
J7-10 = VDC input signal to the microboard. See the formula above for voltage readings that correspond to specific suction pressures.
J7-1 = +5VDC return
J7-2 = drain (shield connection = 0VDC)

If the optional Suction Transducer is not used on the YCUL0016 - YCUL0066 , a Low Pressure switch will be used. Following are the microboard connections for the Low Pressure switch.

System 1 Low Pressure Switch

J4-5 = +5VDC regulated supply to LP switch.
J4-10 = input signal to the microboard. 0VDC = open switch / +5VDC = closed switch.
J4-2 = drain (shield connection = 0VDC)

System 2 Low Pressure Switch

J7-5 = +5VDC regulated supply to LP switch.
J7-10 = input signal to the microboard. 0VDC = open switch / +5VDC = closed switch.
J7-2 = drain (shield connection = 0VDC)

DIGITAL OUTPUTS

Refer to the unit wiring diagram and Fig. 14 and Table 35. The digital outputs are located on TB3, TB4, and TB5 of the microboard. **ALL OUTPUTS ARE 120VAC** with the exception of TB5-3 to TB5-4. TB5-3 to TB5-4 are the contacts that can be used for an evaporator pump start signal. The voltage applied to either of these terminals would be determined by field wiring.

Each output is controlled by the microprocessor by switching 120VAC to the respective output connection energizing contactors, evaporator heater, and solenoids according to the operating sequence.

120VAC is supplied to the microboard via connections at TB3-1, TB3-7, TB4-3, and TB4-7. Figure 23 illustrates the relay contact architecture on the microboard.

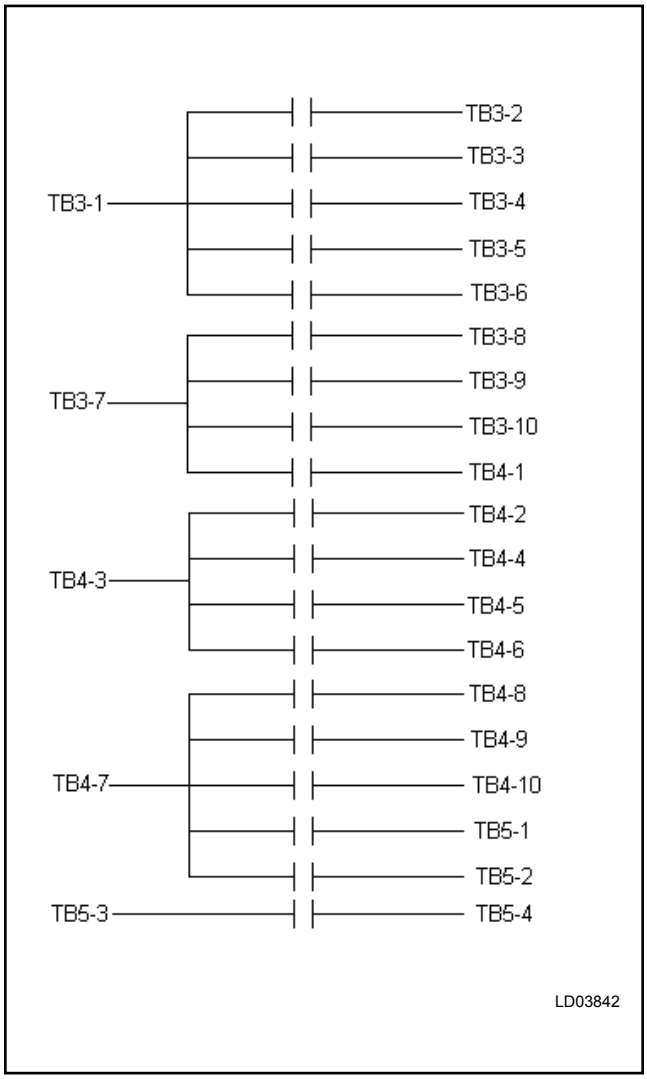


FIG. 23 – MICROBOARD RELAY CONTACT ARCHITECTURE

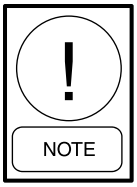
KEYPAD

The operator keypad is connected to the microboard by a ribbon cable, which is connected to J2 on the microboard.

The integrity of a specific "button" on the keypad can be verified by doing a continuity check across two specific points (or pins), that represent one of twelve "buttons" on the keypad.

Table 39 lists the key/pin assignments for the keypad. **Power to the microboard must be turned off, and the ribbon cable disconnected from the microboard prior to conducting the tests, or component damage may result.**

After the ribbon cable is disconnected from microboard, ohmmeter leads are connected to the pins representing the specific "button" to be tested. After connecting the meter leads, the "button" being checked is pressed and a reading of zero ohms should be observed. After releasing the "button," the resistance value should be infinite (open circuit).



Pin 1 is usually identified by a stripe on the ribbon cable.

TABLE 39 – KEYPAD PIN ASSIGNMENT MATRIX

KEYPAD	PIN CONNECTIONS
STATUS	1 TO 5
OPER DATA	1 TO 7
PRINT	1 TO 6
HISTORY	1 TO 8
UP ARROW	2 TO 5
DOWN ARROW	2 TO 7
ENTER/ADV	2 TO 6
COOLING SETPOINTS	2 TO 8
SCHEDULE/ADVANCE DAY	3 TO 5
PROGRAM	3 TO 7
OPTIONS	3 TO 6
CLOCK	3 TO 8

OPTIONAL PRINTER INSTALLATION

The micro panel is capable of supplying a printout of chiller conditions or fault shutdown information at any given time. This allows operator and service personnel to obtain data and system status with the touch of the keypad. In addition to manual print selection, the micro panel will provide an automatic printout whenever a fault occurs. Detailed explanation of the print function is given under "Print Key" located in the Keypad and Display section.

YORK recommends the field tested WEIGH-TRONIX model 1220 printer (or former IMP 24). This is a compact low cost printer that is ideal for service work and data logging.

The WEIGH-TRONIX printer can be obtained by contacting WEIGH-TRONIX for purchase information at:

WEIGH-TRONIX
2320 Airport Blvd.
Santa Rosa, CA 95402
Phone: 1-800-982-6622 or 1-707-527-5555
(International Orders Only)

The part number for the printer that is packaged specifically for YORK is P/N 950915576. The cable to connect the printer can either be locally assembled from the parts listed, or ordered directly from WEIGH-TRONIX under part number 287-040018.

PARTS

The following parts are required:

1. WEIGH-TRONIX model 1220 printer.
2. 2.25" (5.7cm) wide desk top calculator paper.
3. 25 ft. (7.62m) maximum length of Twisted Pair Shielded Cable (minimum 3 conductor), #18 AWG stranded, 300V minimum insulation.
4. One 25 pin Cannon connector and shell.

Connector: Cannon P/N DB-25P or equivalent.

Shell: Cannon P/N DB-C2-J9.

ASSEMBLY AND WIRING

All components should be assembled and wired as shown in Figure 24. Strip the outside insulation back several inches and individual wires about 3/8" (9.5 mm) to connect the cable at the Microboard. Do not connect the shield at the printer-end of the cable.

Obtaining a Printout

A printout is obtained by pressing the "PRINT" key on the keypad and then pressing either the "OPER DATA" key or "HISTORY" key.

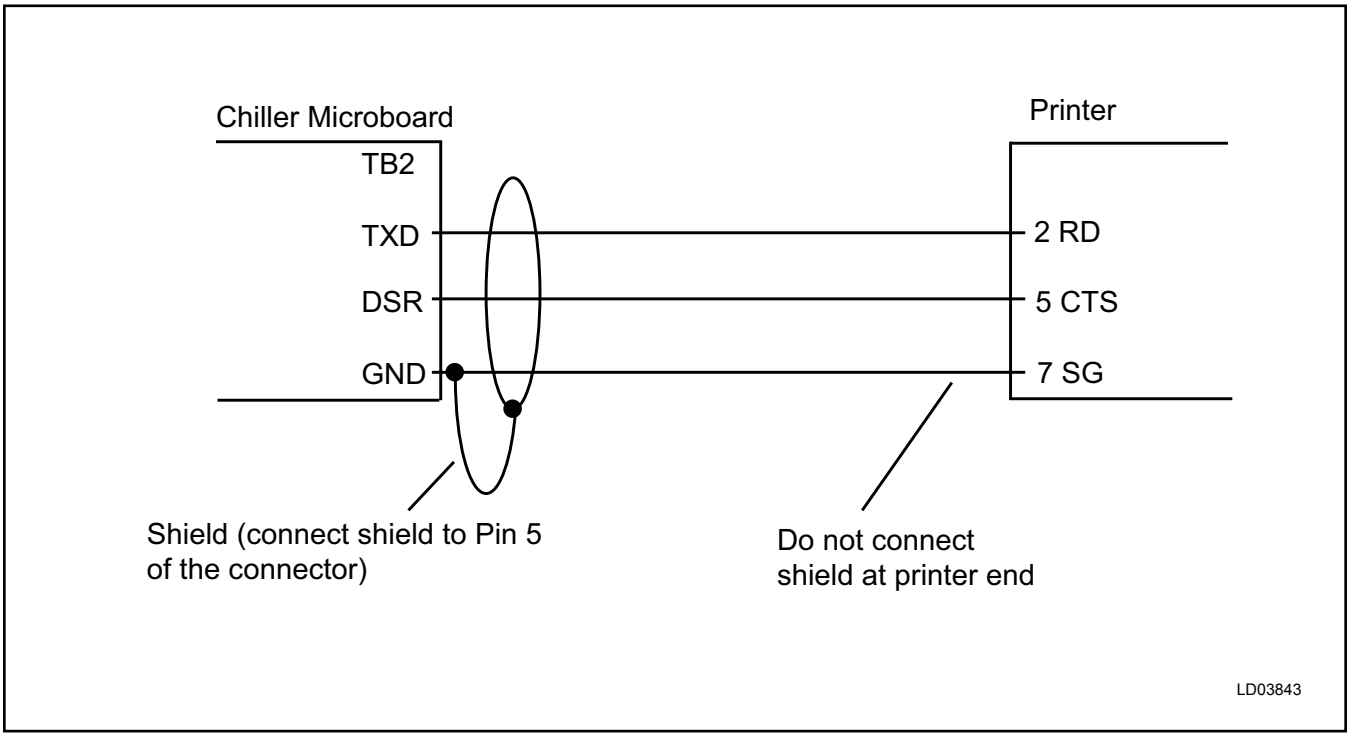


FIG. 24 – PRINTER TO MICROBOARD ELECTRICAL CONNECTIONS

TROUBLESHOOTING

TABLE 40 – TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
No display on panel. Unit will not operate.	1. No 115VAC to 1T.	1a. Check wiring and fuse 3FU b. Check wiring emergency stop contacts 5 to L of CTB2 Terminal Block. c. Replace 1T
	2. No 24VAC to Microboard	2. Check wiring 1T to Microboard.
	3. 1T defective, no 24VAC output.	3. Replace 1T
	4. Short in wire to temp. sensors or pressure transducers.	4. Unplug connections at Microboard to isolate.
	5. Defective Microboard or Display board.	5. Replace Microboard. NOTE: Contact YORK Service before Replacing circuit Boards!
"FLOW SWITCH/REM STOP NO RUN PERMISSIVE" switch	1. No air flow.	1. Check air flow.
	2. Air flow switch improperly installed.	2. Check that the air flow is installed according to manufacturer's instructions.
	3. Defective air flow switch.	3. Replace air flow switch.
	4. Remote cycling device open.	4. Check cycling devices connected to terminals 13 and 14 of the CTB1 Terminal Block.
"LOW SUCTION PRESSURE" FAULT	1. Improper suction pressure cutouts adjustments.	1. Adjust per recommended settings.
	2. Low refrigerant charge.	2. Repair leak if necessary and add refrigerant.
	3. Fouled filter dryer.	3. Change dryer/core.

CONT'D

TROUBLESHOOTING (CONT'D)

PROBLEM	CAUSE	SOLUTION
"LOW SUCTION PRESSURE" FAULT (CONT'D)	4. TXV defective. 5. Reduced flow of air through the evaporator coil. 6. Defective suction pressure transducer/low pressure switch or wiring. 7. LLSV defective	4. Replace TXV. 5. Check CFM 6. Replace transducer/low pressure switch or faulty wiring. Refer to "Service" section for pressure/voltage formula. 7. Replace LLSV
"HIGH DISCHARGE PRESSURE" FAULT	1. Condenser fans not operating or operating backwards. 2. Too much refrigerant. 3. Air in refrigerant system. 4. Defective discharge pressure transducer.	1. Check fan motor, fuses, and contactors. Assure fan blows air upward. 2. Remove refrigerant. 3. Evacuate and recharge system. 4. Replace discharge pressure transducer. Refer to Service section for pressure/voltage formula.
"MP / HPCO" FAULT	1. Compressor internal motor protector (MP) open. 2. External overload tripped. 3. HPCO switch open 4. Defective HPCO switch 5. Defective CR relay	1. Verify refrigerant charge is not low. Verify superheat setting of °10 - 15°F (5.6° - 8.3°C). Verify correct compressor rotation. Verify compressor is not over loaded. 2. Determine cause and reset. 3. See "High Press. Disch." Fault. 4. Replace HPCO switch 5. Replace relay

CONT'D

TROUBLESHOOTING (CONT'D)

PROBLEM	CAUSE	SOLUTION
COMPRESSOR(S) WON'T START	1. Demand not great enough.	1. No problem. Consult "Installation" Manual to aid in understanding compressor operation and capacity control.
	2. Defective discharge air temperature sensor.	2. Compare the display with a thermometer. Should be within +/- 2 degrees. Refer to Service section for Dis charge Air temp./voltage table.
	3. Contactor/Overload failure	3. Replace defective part.
	4. Compressor failure	4. Diagnose cause of failure and replace.
LACK OF COOLING EFFECT	1. Dirty evaporator surface. Low suction pressure will be observed.	1. Contact the local YORK service representative.
	2. Improper CFM through the evaporator coil.	2. Verify nominal 400 CFM/ton air flow through evaporator coil.
	3. Low refrigerant charge. Low suction pressure will be observed.	3. Check subcooling and add charge as needed.

MAINTENANCE

It is the responsibility of the equipment owner to provide maintenance on the system.

IMPORTANT

If system failure occurs due to improper maintenance during the warranty period, YORK will not be liable for costs incurred to return the system to satisfactory operation. The following is intended only as a guide and covers only the chiller unit components. It does not cover other related system components which may or may not be furnished by YORK. System components should be maintained according to the individual manufacture's recommendations as their operation will affect the operation of the chiller.

COMPRESSORS

Oil Level check

The oil level can only be tested when the compressor is running in stabilized conditions, to ensure that there is no liquid refrigerant in the lower shell of the compressor. When the compressor is running at stabilized conditions, the oil level must be between 1/4 and 3/4 in the oil sight glass. Note: at shutdown, the oil level can fall to the bottom limit of the oil sight glass. Use YORK "F" oil when adding oil.

Oil Analysis

The oil used in these compressors is pale yellow in color (mineral oil). If the oil color darkens or exhibits a change in color, this may be an indication of contaminants in the refrigerant system. If this occurs, an oil sample should be taken and analyzed. If contaminants are present, the system must be cleaned to prevent compressor failure.

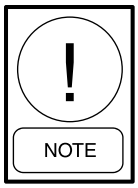
Never use the scroll compressor to pump the refrigerant system down into a vacuum. Doing so will cause internal arcing of the compressor motor which will result in failure of compressor.

CONDENSER FAN MOTORS

Condenser fan motors are permanently lubricated and require no maintenance.

CONDENSER COILS

Dirt should not be allowed to accumulate on the condenser coil surfaces. Cleaning should be as often as necessary to keep coil clean.



Exercise care when cleaning the coil so that the coil fins are not damaged.

OPERATING PARAMETERS

Regular checks of the system should be preformed to ensure that operating temperatures and pressures are within limitations, and that the operating controls are set within proper limits. Refer to the Operation, Start-Up, and Installation sections of this manual.

ON-BOARD BATTERY BACK-UP

U17 is the Real Time Clock chip that maintains the date/time and stores customer programmed setpoints. Anytime the chiller is to be off (no power to the microboard) for an extended time (weeks/months), the clock should be turned off to conserve power of the on-board battery. To accomplish this, the J11 jumper on the microboard must be moved to the "CLKOFF" position while power is still supplied to the microboard.

OVERALL UNIT INSPECTION

In addition to the checks listed on this page, periodic overall inspections of the unit should be accomplished to ensure proper equipment operation. Items such as loose hardware, component operation, refrigerant leaks, unusual noises, etc. should be investigated and corrected immediately.

ISN CONTROL

RECEIVED DATA (CONTROL DATA)

The Middle Market receives 8 data values from the ISN. The first 4 are analog values and the last 4 are digital values. These 8 data values are used as control parameters when in REMOTE mode. When the unit is in LOCAL mode, these 8 values are ignored. If the unit receives no valid ISN transmission for 5 minutes it will revert back to all local control values. Table 41 lists the 5 control parameters. These values are found under feature 54 on the ISN.

TABLE 41 – ISN RECEIVED DATA

ISN PAGE	CONTROL DATA
P03	SETPOINT 99 = AUTO
P04	LOAD LIMIT STAGE (0,1, 2)
P05	–
P06	–
P07	START/STOP COMMAND (0 = STOP, 1 = RUN)
P08	—
P09	—
P10	HISTORY BUFFER REQUEST (0 = CURRENT DATA, 1 = LAST HISTORY DATA)

TRANSMITTED DATA

After receiving a valid transmission from the ISN, the unit will transmit either operational data or history buffer data depending on the “History Buffer Request” on ISN PAGE 10. Data must be transmitted for every ISN page under feature 54. If there is no value to be sent to a particular page, a zero will be sent. Tables 42 - 43 show the data values and page listings for this unit.

TABLE 42 – ISN TRANSMITTED DATA

ISN PG.	TYPE	DATA
P11	Analog	Leaving Chilled Liquid Temp
P12	Analog	Return Chilled Liquid temp
P13	Analog	–
P14	Analog	–
P15	Analog	SYS 1 Suction Temp (EEV Only)
P16	Analog	Ambient Air Temperature
P17	Analog	SYS 1 Suction Superheat (EEV Only)
P18	Analog	SYS 1 Run Time (seconds)
P19	Analog	SYS 1 Suction Pressure
P20	Analog	SYS 1 Discharge Pressure
P21	Analog	SYS 1 Cooler Inlet Refrigerant Temp (R-407c Only)
P22	Analog	–
P23	Analog	SYS 1 EEV Output % (EEV Only)
P24	Analog	SYS 1 Anti-Recycle Timer
P25	Analog	Anti-Coincidence Timer
P26	Analog	SYS 2 Suction Temp. (EEV Only)
P27	Analog	SYS 2 Run Time (seconds)
P28	Analog	SYS 2 Suction Pressure
P29	Analog	SYS 2 Discharge Pressure
P30	Analog	SYS 2 Cooler Inlet Refrigerant Temp (R-407c Only)
P31	Analog	–
P32	Analog	SYS 2 Suction Superheat (EEV Only)
P33	Analog	SYS 2 Anti-Recycle Timer
P34	Analog	SYS 2 EEV Output % (EEV Only)
P35	Analog	Number of Compressors
P36	Digital	SYS 1 Alarm
P37	Digital	SYS 2 Alarm
P38	Digital	Evaporator Heater Status
P39	Digital	Evaporator Pump Status
P40	Digital	SYS 1 Comp 1 Run
P41	Digital	SYS 2 Comp 1 Run
P42	Digital	SYS 1 Liquid Line Solenoid Valve or EEV Pilot Solenoid
P43	Digital	SYS 1 Hot Gas Bypass Valve
P44	Digital	SYS 1 Comp 2 Run
P45	Digital	SYS 2 Comp 2 Run
P46	Digital	SYS 2 Liquid Line Solenoid Valve or EEV Pilot Solenoid
P47	Digital	Lead System (0=SYS 1, 1=SYS 2)
P48	Digital	SYS 1 Comp 3 Run

TABLE 42 – ISN TRANSMITTED DATA (CONT'D)

ISN PG.	TYPE	DATA
P49	Digital	SYS 2 Comp 3 Run
P50	Digital	Chilled Liq. Type (0=Water, 1=Glycol)
P51	Digital	Ambient Control Mode (0=Std Ambient, 1=Low Ambient)
P52	Digital	Local/Remote Control Mode (0=Local, 1=Remote)
P53	Digital	Units (0=Imperial, 1=SI)
P54	Digital	Lead/Lag Control Mode (0=Manual, 1=Automatic)
P55	Digital	—
P56	Coded	* SYS 1 Operational Code
P57	Coded	* SYS 1 Fault Code
P58	Coded	* SYS 2 Operational Code
P59	Coded	* SYS 2 Fault Code
P60	Coded	—
P61	Coded	SYS 1 Condenser Fan Stage
P62	Coded	—
P63	Coded	SYS 2 Condenser Fan Stage
P64	Coded	—
P65	Coded	Unit Control Mode (0=Leaving Water, 1=Return Water, 2=Discharge Air, 3=Suction Press., 4=Cooling, 5=Heating)
P66	Analog	Anti-Recycle Time (Programmed)
P67	Analog	Leaving Chilled Liquid Temp Cutout
P68	Analog	Low Ambient Temp Cutout
P69	Analog	—
P70	Analog	Low Suction Pressure Cutout
P71	Analog	High Discharge Pressure Cutout
P72	Analog	Setpoint
P73	Analog	Cooling Range
P74	Analog	—
P75	Analog	—
P76	Analog	SYS 1 Discharge Temp (EEV Only - Optional)
P77	Analog	SYS 1 Discharge Superheat (EEV Only - Optional)
P78	Analog	SYS 2 Discharge Temp (EEV Only - Optional)
P79	Analog	SYS 2 Discharge Superheat (EEV Only - Optional)
P80	Digital	—
P81	Digital	—
P82	Digital	—
P83	Digital	—
P84	Digital	—

TABLE 43 – ISN OPERATIONAL AND FAULT CODES

P56/58	OPERATIONAL CODE	P57/59	FAULT CODE
0	NO ABNORMAL CONDITION	**0**	NO FAULT
1	UNIT SWITCH OFF	**1**	VAC UNDER VOLTAGE
2	SYSTEM SWITCH OFF	**2**	LOW AMBIENT TEMPERATURE
3	LOCK-OUT	**3**	HIGH AMBIENT TEMPERATURE
4	UNIT FAULT	**4**	LOW LEAVING CHILLED LIQUID TEMP
5	SYSTEM FAULT	**5**	HIGH DISCHARGE PRESSURE
6	REMOTE SHUTDOWN	**6**	HIGH DIFFERENTIAL OIL PRESSURE
7	DAILY SCHEDULE SHUTDOWN	**7**	LOW SUCTION PRESSURE
8	NO RUN PERMISSIVE	**8**	HIGH MOTOR CURRENT
9	NO COOL LOAD	**9**	LLSV NOT ON
10	ANTI-COINCIDENCE TIMER ACTIVE	**10**	LOW BATTERY WARNING
11	ANTI-RECYCLE TIMER ACTIVE	**11**	HIGH OIL TEMPERATURE
12	MANUAL OVERRIDE	**12**	HIGH DISCHARGE TEMPERATE
13	SUCTION LIMITING	**13**	IMPROPER PHASE ROTATION
14	DISCHARGE LIMITING	**14**	LOW MOTOR CURRENT /MP / HPCO
15	CURRENT LIMITING	**15**	MOTOR CURRENT UNBALANCED
16	LOAD LIMITING	**16**	LOW DIFFERENTIAL OIL PRESSURE
17	COMPRESSOR(S) RUNNING	**17**	GROUND FAULT
18	HEAT PUMP LOAD LIMITING	**18**	MP /HPCO
		19	LOW EVAPORATOR TEMPERATURE
		20	INCORRECT REFRIGERANT PROGRAMMED
		21	POWER FAILURE, MANUAL RESET REQUIRED
		22	UNIT MOTOR CURRENT
		23	LOW SUPERHEAT
		24	SENSOR FAIL
		26	MP /HPCO INHIBIT

* The operational and fault codes sent to pages 56 through 59 are defined in Table 43. Note that this table of fault and operational codes is for all DX products. The codes that are grayed out are not used on all units.

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ELEMENTARY DIAGRAM
YCUL0016E_ – YCUL0036E_

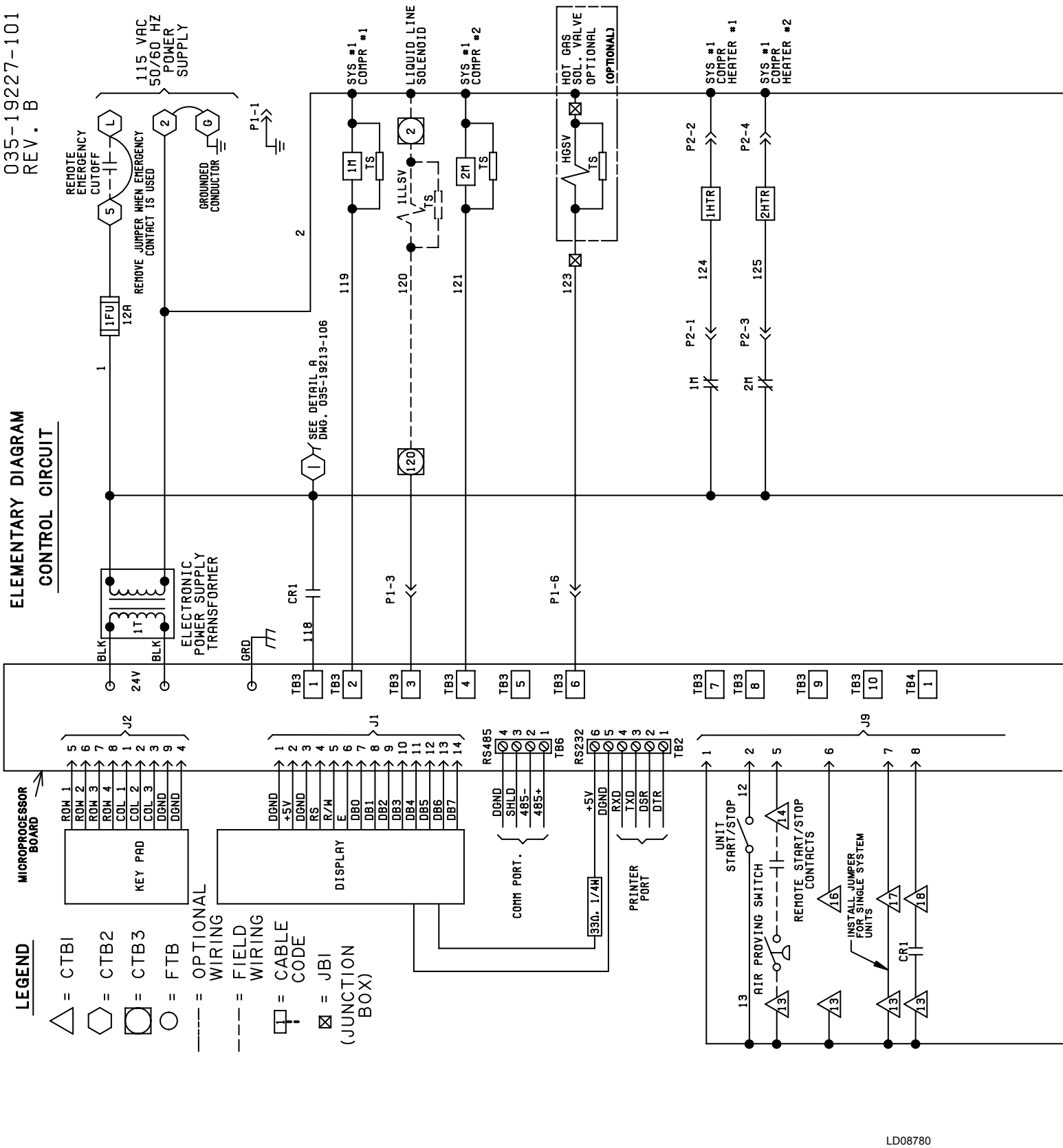
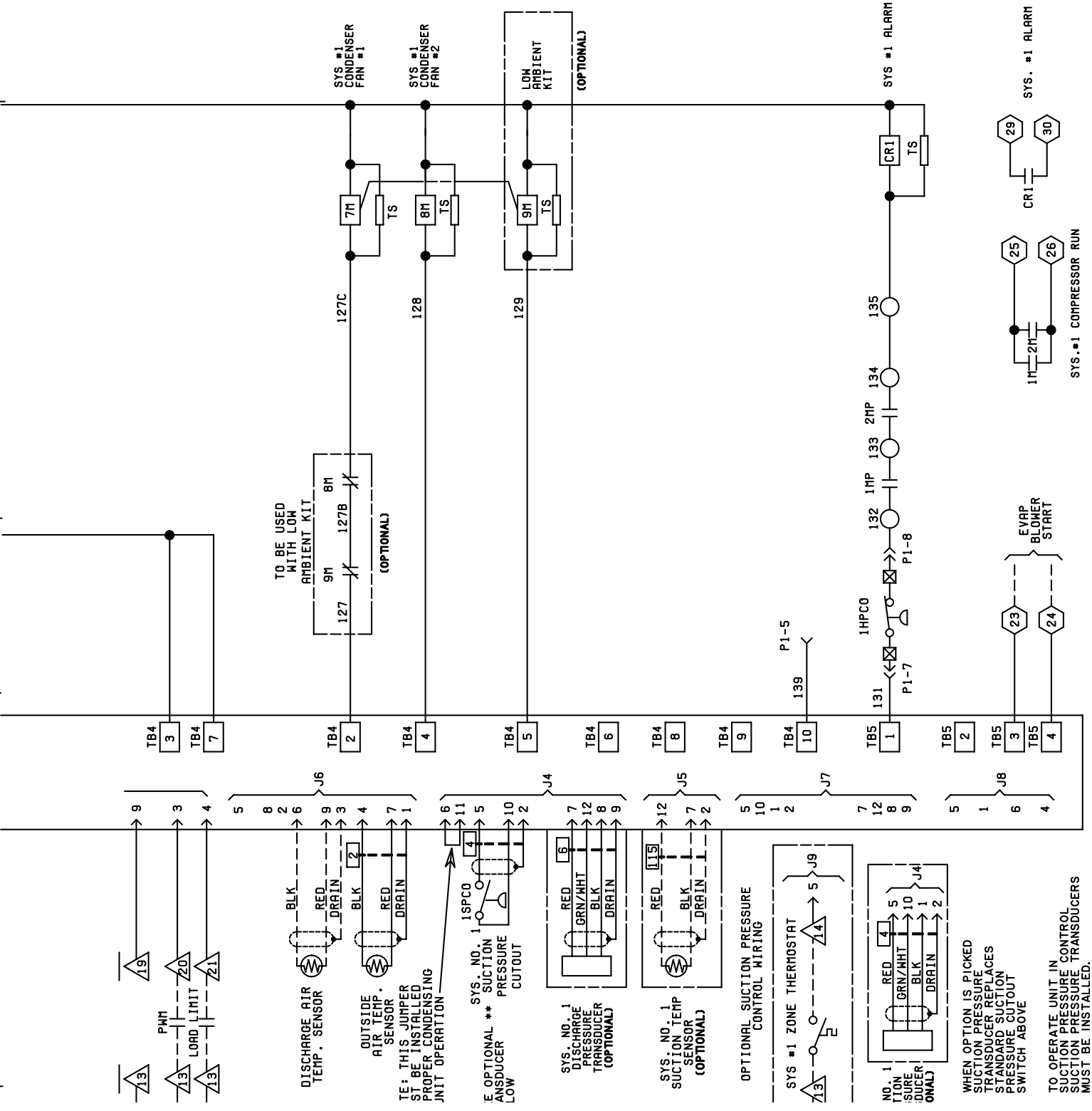


FIG. 25 – ELEMENTARY DIAGRAM, CONTROL CIRCUIT – YCUL0016E_ - YCUL0036E_


SYS #1 CONDENSER FAN #1
SYS #1 CONDENSER FAN #2
LOW AMBIENT KIT
(OPTIONAL)
SYS #1 ALARM
SYS. #1 ALARM
7M
8M
9M
TS
CR1
127C
128
129
135
134
2MP
133
1MP
132
1HPCO
P1-8
P1-7
P1-5
139
131
TO BE USED WITH LOW AMBIENT KIT
127
127B
(OPTIONAL)
EVAP BLOWER START
SYS.#1 COMPRESSOR RUN
1M
2M
TB4
TB5
J4
J5
J6
J7
J8
J9
DISCHARGE AIR TEMP. SENSOR
OUTSIDE AIR TEMP. SENSOR
TE: THIS JUMPER ST BE INSTALLED PROPER CONDENSING JNIT OPERATION
E OPTIONAL ** ANSDUCER LOW
SYS. NO. 1 SUCTION PRESSURE CUTOUT
1SPCO
SYS. NO. 1 DISCHARGE PRESSURE TRANSDUCER (OPTIONAL)
SYS. NO. 1 SUCTION TEMP SENSOR (OPTIONAL)
OPTIONAL SUCTION PRESSURE CONTROL WIRING
SYS #1 ZONE THERMOSTAT
NO. 1 TION SURE DUCER ONAL)
PWM
LOAD LIMIT
BLK
RED
GRN/WHT
DRAIN
WHEN OPTION IS PICKED SUCTION PRESSURE TRANSDUCER REPLACES STANDARD SUCTION PRESSURE CUTOUT SWITCH ABOVE
TO OPERATE UNIT IN SUCTION PRESSURE CONTROL SUCTION PRESSURE TRANSDUCERS MUST BE INSTALLED.

LD08801

ELEMENTARY DIAGRAM
YCUL0016E_ – YCUL0036E_

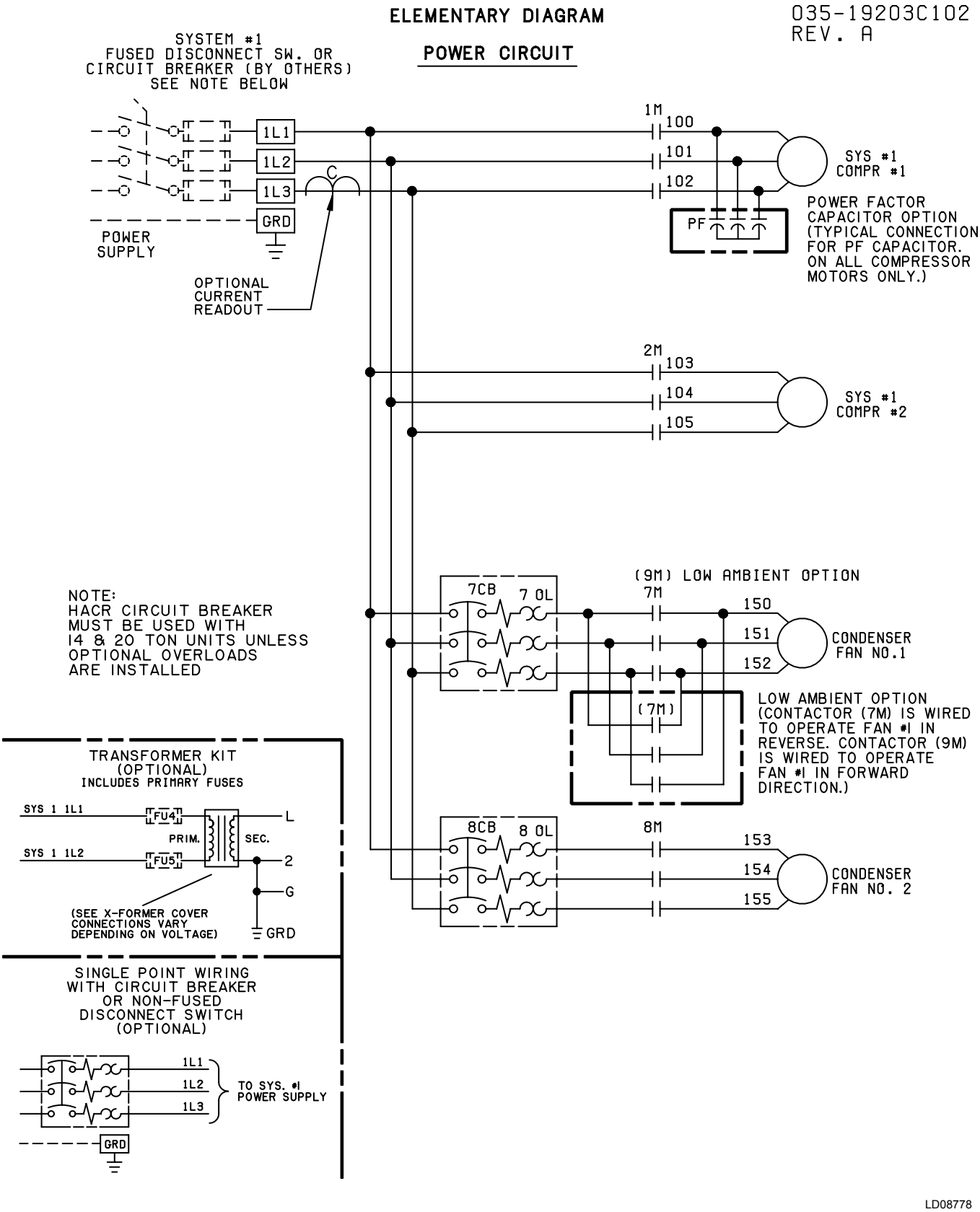


FIG. 26 – ELEMENTARY DIAGRAM, POWER CIRCUIT – YCUL0016E_ - YCUL0036E_

ELEMENTARY DIAGRAM
YCUL0016E_ – YCUL0036E_

ELEMENTARY DIAGRAM
MIDDLE MARKET
STANDARD AND REMOTE EVAPORATOR UNITS

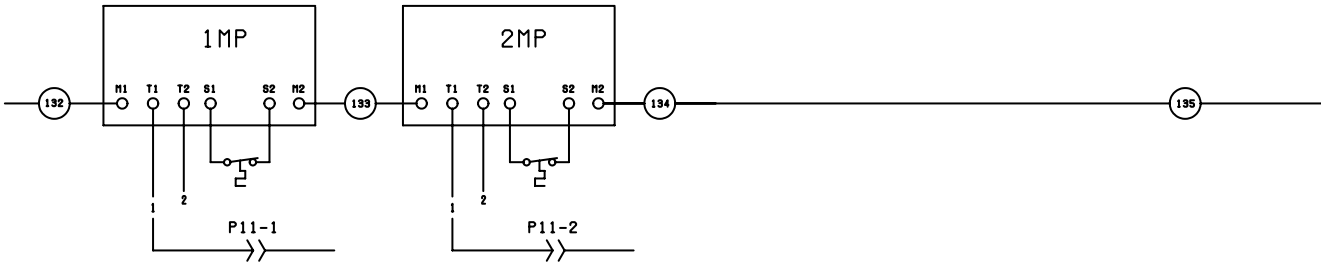
035-19213-106
REV. B

NOTES:
1. FIELD WIRING TO BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS ALL OTHER APPLICABLE CODES AND SPECIFICATIONS.
2. CONTACTS MUST BE SUITABLE FOR SWITCHING 24VDC. (GOLD CONTACTS RECOMMENDED). WIRING SHALL NOT BE RUN IN THE SAME CONDUIT WITH ANY LINE VOLTAGE (CLASS I) WIRING.
3. TO CYCLE UNIT ON AND OFF AUTOMATICALLY WITH CONTACT SHOWN, INSTALL A CYCLING DEVICE IN SERIES WITH THE FLOW SWITCH. SEE NOTE 2 FOR CONTACT RATING AND WIRING SPECIFICATIONS.
4. TO STOP UNIT (EMERGENCY STOP) WITH CONTACTS OTHER THAN THOSE SHOWN, INSTALL THE STOP CONTACT BETWEEN TERMINALS 5 AND 1. IF A STOP DEVICE IS NOT INSTALLED, A JUMPER MUST BE CONNECTED BETWEEN TERMINALS 5 AND 1. DEVICE MUST HAVE A MINIMUM CONTACT RATING OF 6A AT 115VOLTS A.C.
5. CONTACTS ARE RATED AT 115V, 100VA, RESISTIVE LOAD ONLY, AND MUST BE SUPPRESSED AT LOAD BY USER.
6. SEE INSTALLATION, OPERATION AND MAINTENANCE MANUAL WHEN OPTIONAL EQUIPMENT IS USED.
7. OPTIONAL CURRENT READOUT. 5V = 225A.
8. 1MP THRU 6MP ARE CONTAINED IN THEIR RESPECTIVE COMPRESSOR JUNCTION BOXES.

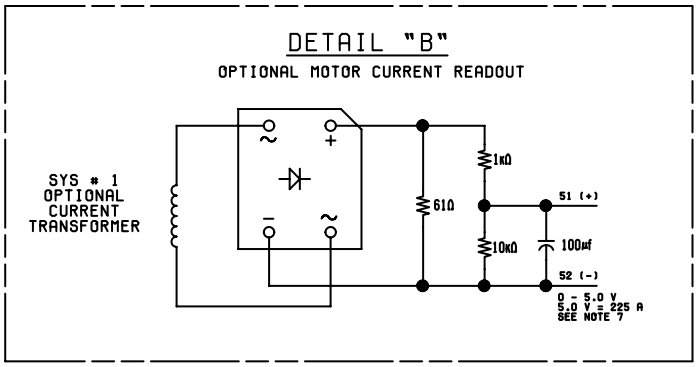
LEGEND

TS	TRANSIENT VOLTAGE SUPRESSION
⬡	TERMINAL BLOCK FOR CUSTOMER CONNECTIONS
△	TERMINAL BLOCK FOR CUSTOMER LOW VOLTAGE (CLASS 2) CONNECTIONS. SEE NOTE 2.
○	TERMINAL BLOCK FOR YORK CONNECTIONS ONLY
———	WIRING AND COMPONENTS BY YORK
——-——	OPTIONAL EQUIPMENT
— — —	WIRING AND/OR COMPONENTS BY OTHERS

DETAIL "A"



DETAIL "B"
OPTIONAL MOTOR CURRENT READOUT



LD08945

FIG. 27 – ELEMENTARY DIAGRAM, MIDDLE MARKET – YCUL0016E_ - YCUL0036E_

CONNECTION DIAGRAM
YCUL0016E_ – YCUL0036E_

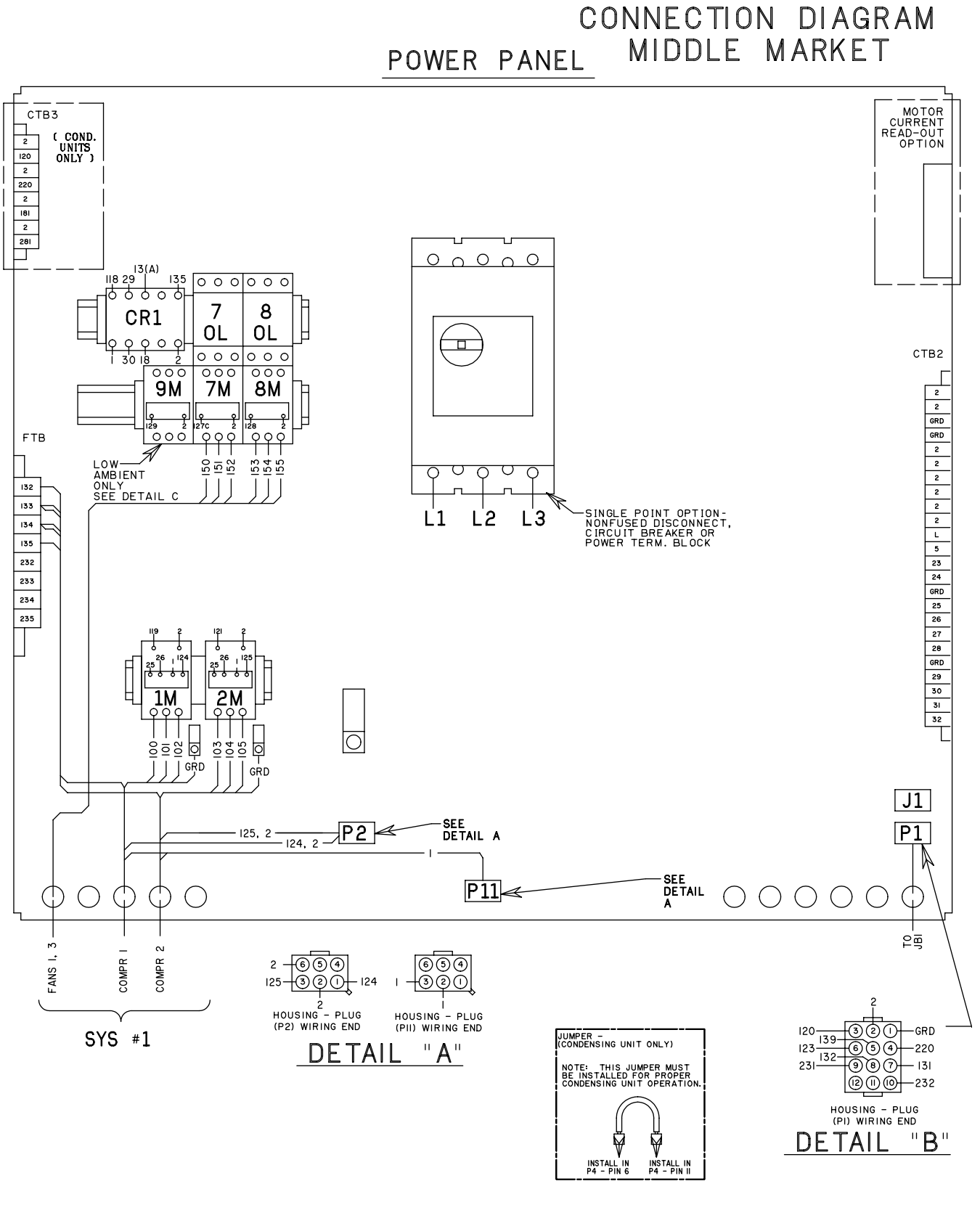


FIG. 28 – CONNECTION DIAGRAM, MIDDLE MARKET – YCUL0016E_ - YCUL0036E_

035-19215-000
REV A

MICRO PANEL

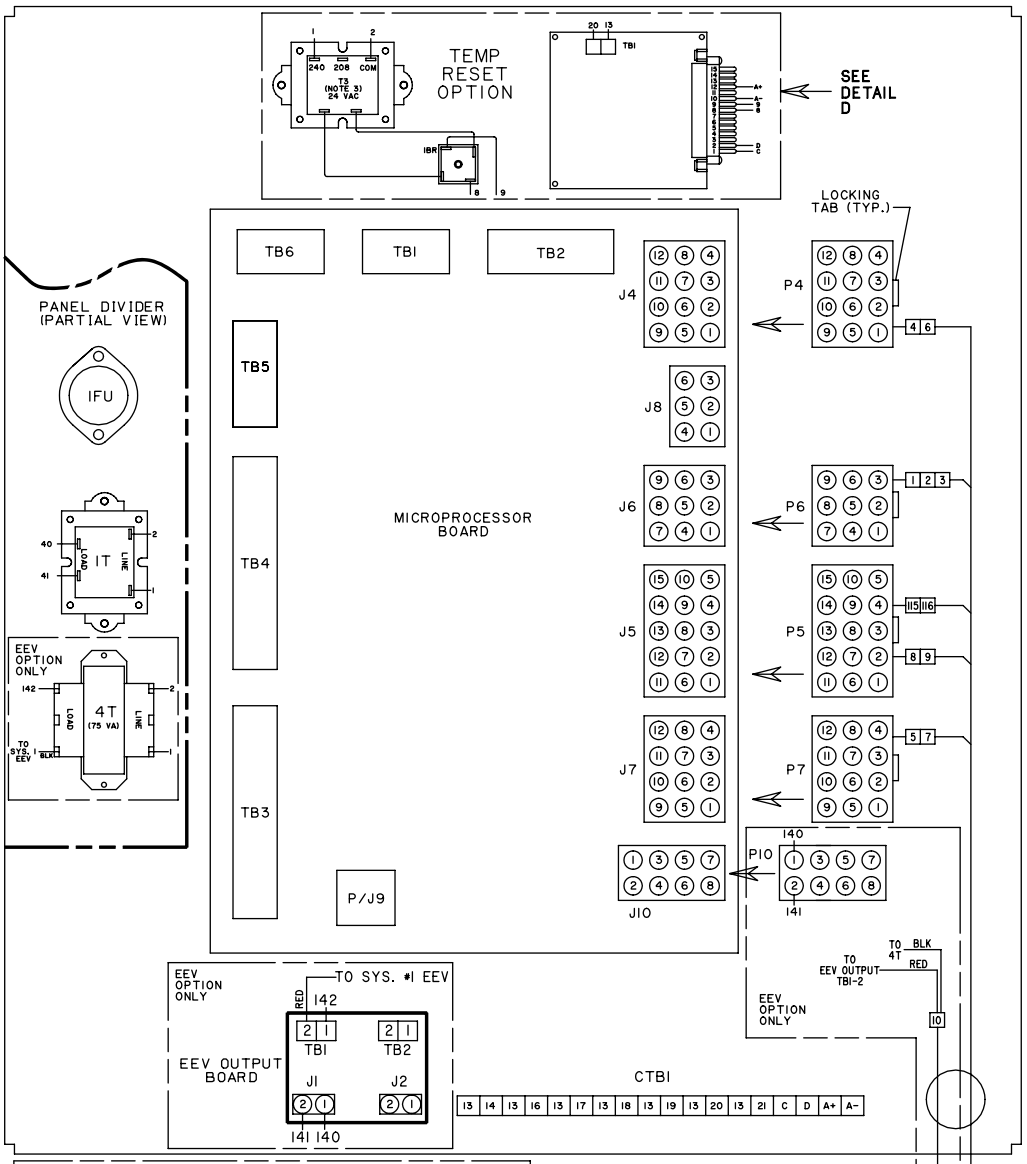
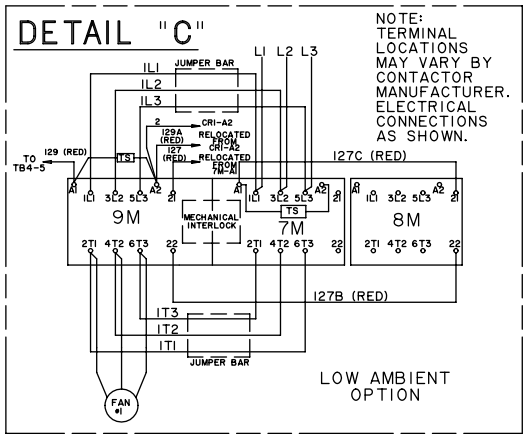
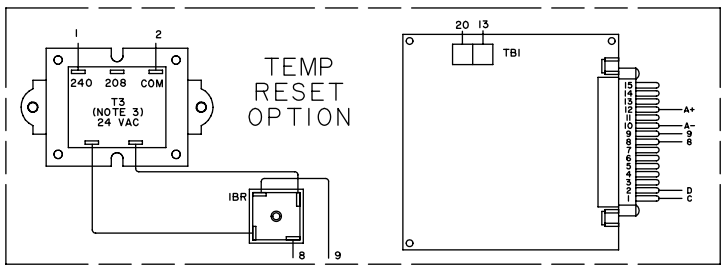


TABLE II

BOARD PLUG NO.	CABLE ITEM NO.	CABLE CODE	WIRE COLOR	PLUG PIN NO.	FUNCTION	LEGEND
MICRO P4	19	4	RED	5	SYS #1 SUCTION PRESSURE	ISPT
			WHT	10		
			BLK	1		
			DRAIN	2		
	(OPTIONAL KIT)	6	RED	7	SYS #1 DISCHARGE PRESSURE	IDPT
			WHT	12		
			BLK	8		
			DRAIN	9		
MICRO P6	19	1	BLK	5	LEAVING WATER TEMP	LWT
			RED	8		
			DRAIN	2		
	19	3	BLK	6	ENTERING WATER TEMP	EWT
			RED	9		
			DRAIN	3		
	19	2	BLK	4	OUTSIDE AIR TEMP.	OAT
			RED	7		
			DRAIN	1		
MICRO P5	STANDARD 40YC	115	RED	12	SYS #1 LIQ. TEMP. SENSOR	ILTS
			BLK	7		
			DRAIN	2		
	(OPTIONAL KIT)	8	RED	14	SYS #1 SUCTION TEMP. SENSOR	ISTS
			BLK	9		
			DRAIN	4		
EEV OUTPUT BOARD AND TRANS FORMER 4T-1 4T (OPTIONAL)	(OPTIONAL KIT)	10	BLK	4T (TRANS)	SYS #1 EEV OUTPUT	IEEV
			RED	EEV OUTPUT BOARD TBI-2		

NOTE: CABLES AND PLUGS (P4 & P6) ARE SUPPLIED IN KIT (ITEM 19)





LD08946

ELEMENTARY DIAGRAM
YCUL0040E_

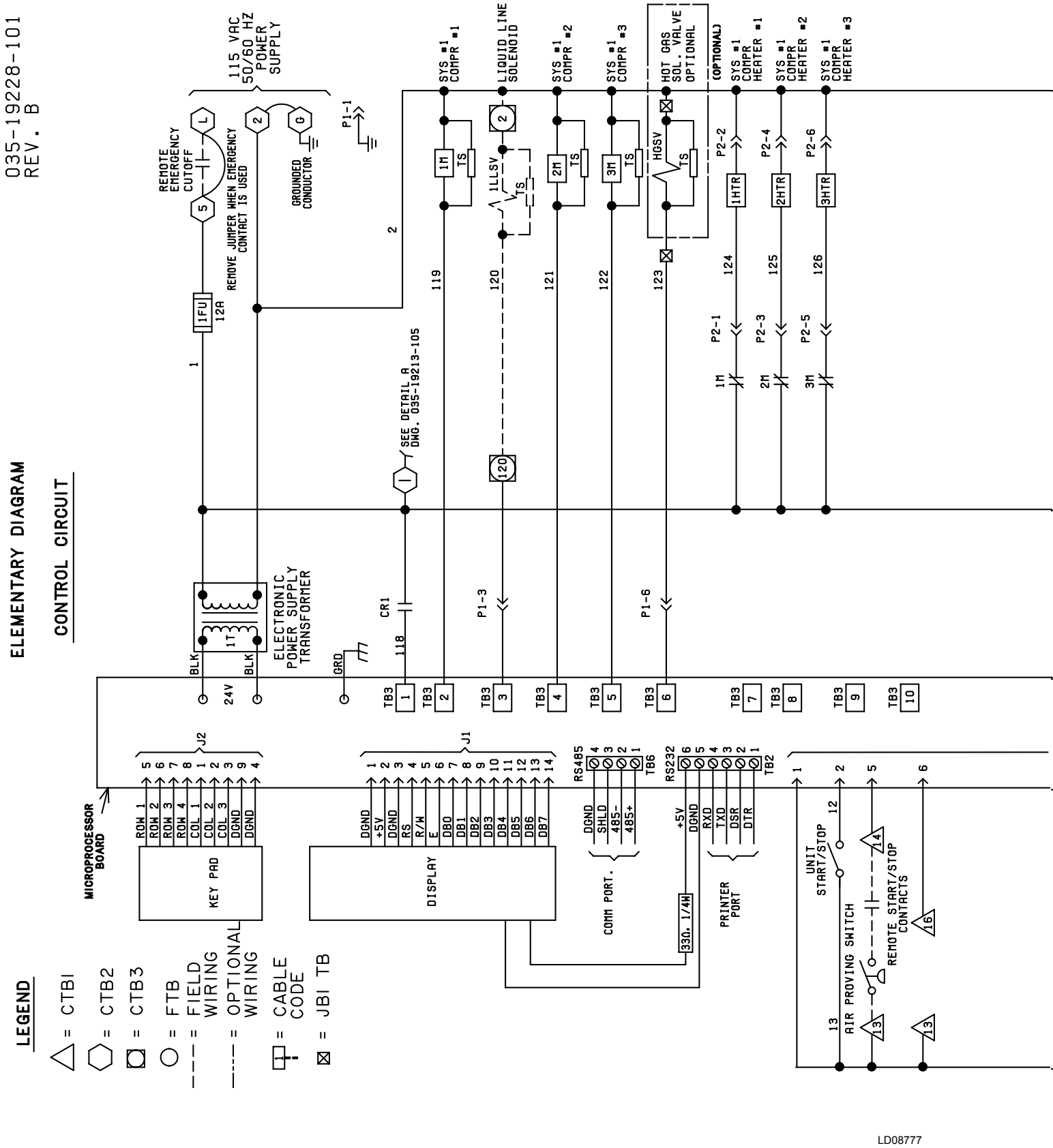
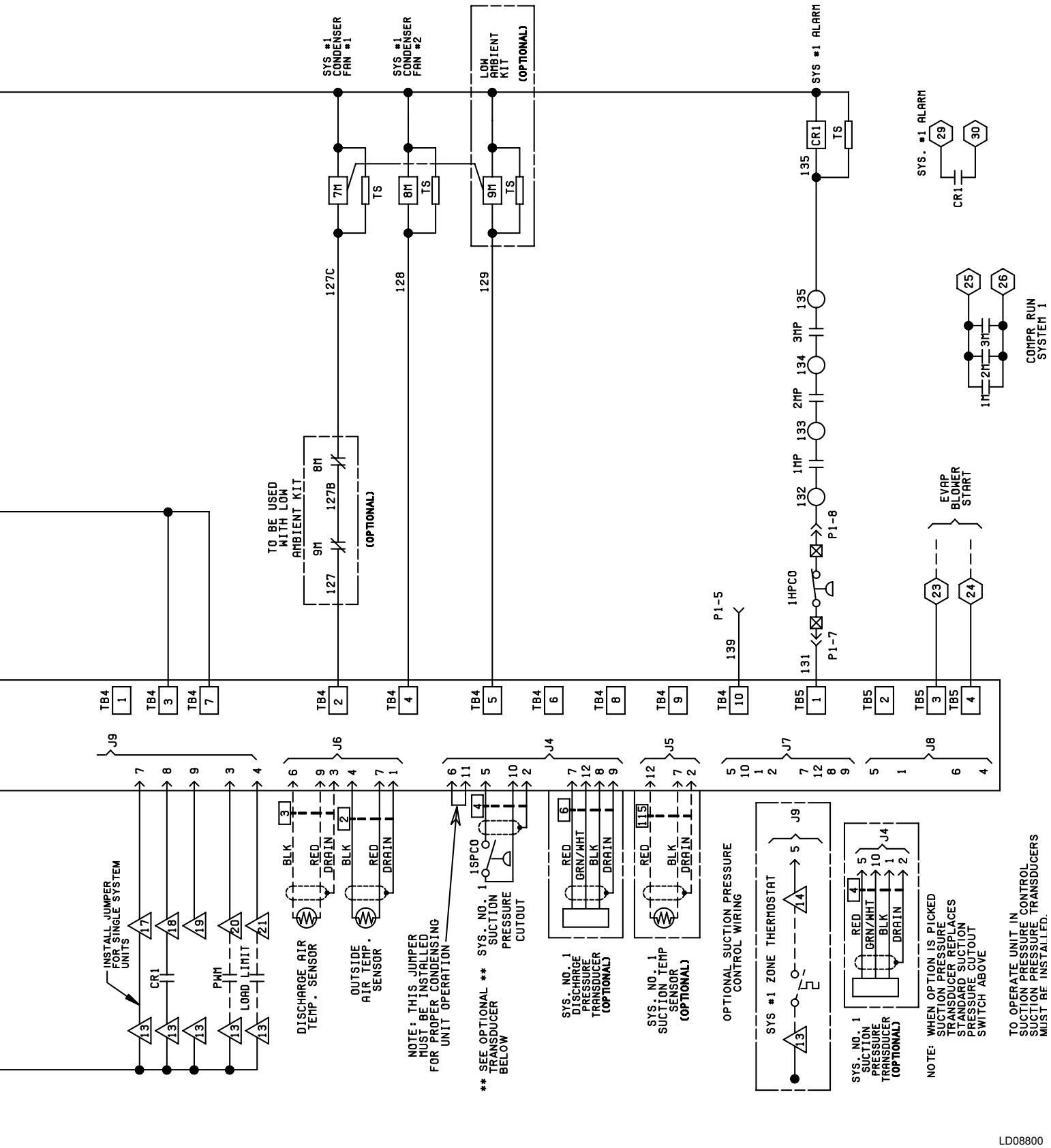


FIG. 29 – ELEMENTARY DIAGRAM, CONTROL CIRCUIT - YCUL0040E_


SYS #1 CONDENSER FAN #1
SYS #1 CONDENSER FAN #2
LOW AMBIENT KIT (OPTIONAL)
SYS #1 ALARM
7M
8M
9M
TS
CR1
127C
128
129
135
TO BE USED WITH LOW AMBIENT KIT
(OPTIONAL)
127
127B
1MP
2MP
3MP
132
133
134
P1-8
P1-7
1HPCO
P1-5
139
131
EVAP BLOWER START
COMPR RUN SYSTEM 1
1M
2M
3M
SYS. #1 ALARM
INSTALL JUMPER FOR SINGLE SYSTEM UNITS
PWM
LOAD LIMIT
DISCHARGE AIR TEMP. SENSOR
OUTSIDE AIR TEMP. SENSOR
NOTE: THIS JUMPER MUST BE INSTALLED FOR PROPER CONDENSING UNIT OPERATION
** SEE OPTIONAL ** TRANSDUCER BELOW
SYS. NO. 1 SUCTION PRESSURE CUTOUT
1SPCO
SYS. NO. 1 DISCHARGE PRESSURE TRANSDUCER (OPTIONAL)
SYS. NO. 1 SUCTION TEMP SENSOR (OPTIONAL)
OPTIONAL SUCTION PRESSURE CONTROL WIRING
SYS #1 ZONE THERMOSTAT
SYS. NO. 1 SUCTION PRESSURE TRANSDUCER (OPTIONAL)
NOTE: WHEN OPTION IS PICKED SUCTION PRESSURE TRANSDUCER REPLACES STANDARD SUCTION PRESSURE CUTOUT SWITCH ABOVE
TO OPERATE UNIT IN SUCTION PRESSURE CONTROL SUCTION PRESSURE TRANSDUCERS MUST BE INSTALLED.
RED
BLK
GRN/WHT
DRAIN

LD08800

ELEMENTARY DIAGRAM
YCUL0040E_

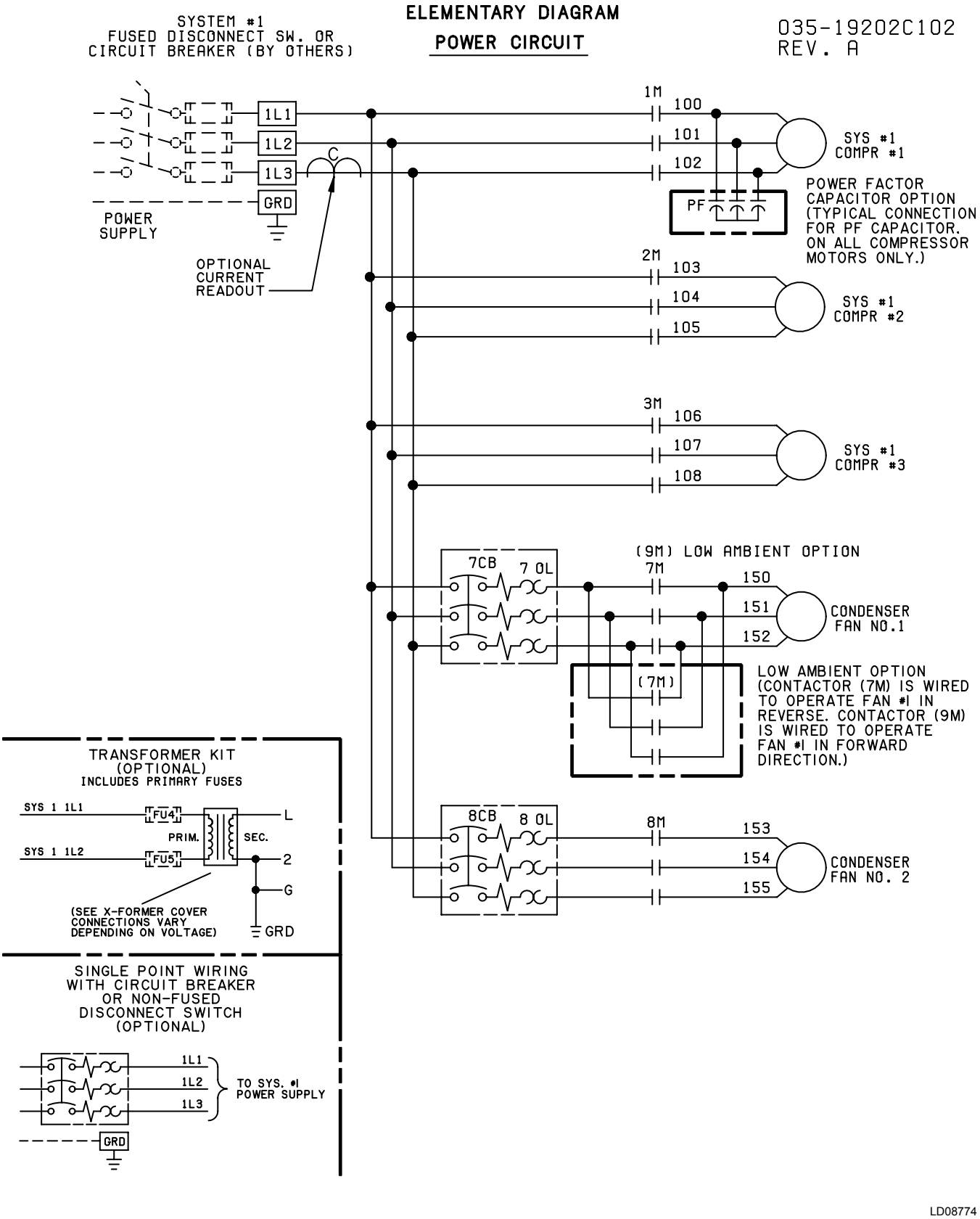


FIG. 30 – ELEMENTARY DIAGRAM, POWER CIRCUIT - YCUL0040E_

ELEMENTARY DIAGRAM
YCUL0040E_

ELEMENTARY DIAGRAM
MIDDLE MARKET
STANDARD AND REMOTE EVAPORATOR UNITS

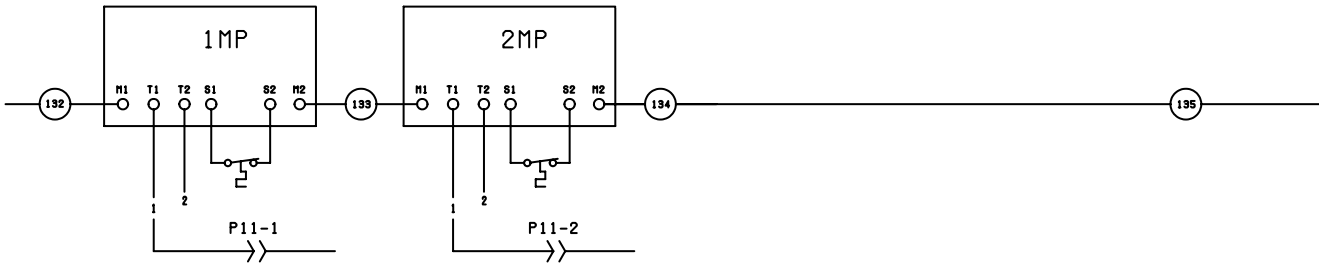
035-19213-106
REV. B

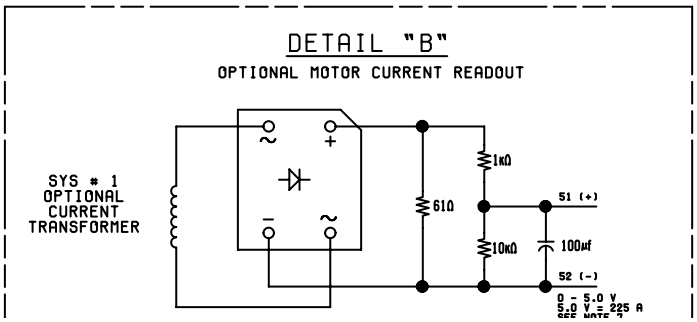
NOTES:
1. FIELD WIRING TO BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS ALL OTHER APPLICABLE CODES AND SPECIFICATIONS.
2. CONTACTS MUST BE SUITABLE FOR SWITCHING 24VDC. (GOLD CONTACTS RECOMMENDED). WIRING SHALL NOT BE RUN IN THE SAME CONDUIT WITH ANY LINE VOLTAGE (CLASS 1) WIRING.
3. TO CYCLE UNIT ON AND OFF AUTOMATICALLY WITH CONTACT SHOWN, INSTALL A CYCLING DEVICE IN SERIES WITH THE FLOW SWITCH. SEE NOTE 2 FOR CONTACT RATING AND WIRING SPECIFICATIONS.
4. TO STOP UNIT (EMERGENCY STOP) WITH CONTACTS OTHER THAN THOSE SHOWN, INSTALL THE STOP CONTACT BETWEEN TERMINALS 5 AND 1. IF A STOP DEVICE IS NOT INSTALLED, A JUMPER MUST BE CONNECTED BETWEEN TERMINALS 5 AND 1. DEVICE MUST HAVE A MINIMUM CONTACT RATING OF 6A AT 115VOLTS A.C.
5. CONTACTS ARE RATED AT 115V, 100VA, RESISTIVE LOAD ONLY, AND MUST BE SUPPRESSED AT LOAD BY USER.
6. SEE INSTALLATION, OPERATION AND MAINTENANCE MANUAL WHEN OPTIONAL EQUIPMENT IS USED.
7. OPTIONAL CURRENT READOUT. 5V = 225A.
8. 1MP THRU 6MP ARE CONTAINED IN THEIR RESPECTIVE COMPRESSOR JUNCTION BOXES.

LEGEND

TS	TRANSIENT VOLTAGE SUPRESSION
⬡	TERMINAL BLOCK FOR CUSTOMER CONNECTIONS
△	TERMINAL BLOCK FOR CUSTOMER LOW VOLTAGE (CLASS 2) CONNECTIONS. SEE NOTE 2.
○	TERMINAL BLOCK FOR YORK CONNECTIONS ONLY
———	WIRING AND COMPONENTS BY YORK
—— - ——	OPTIONAL EQUIPMENT
— — —	WIRING AND/OR COMPONENTS BY OTHERS

DETAIL "A"

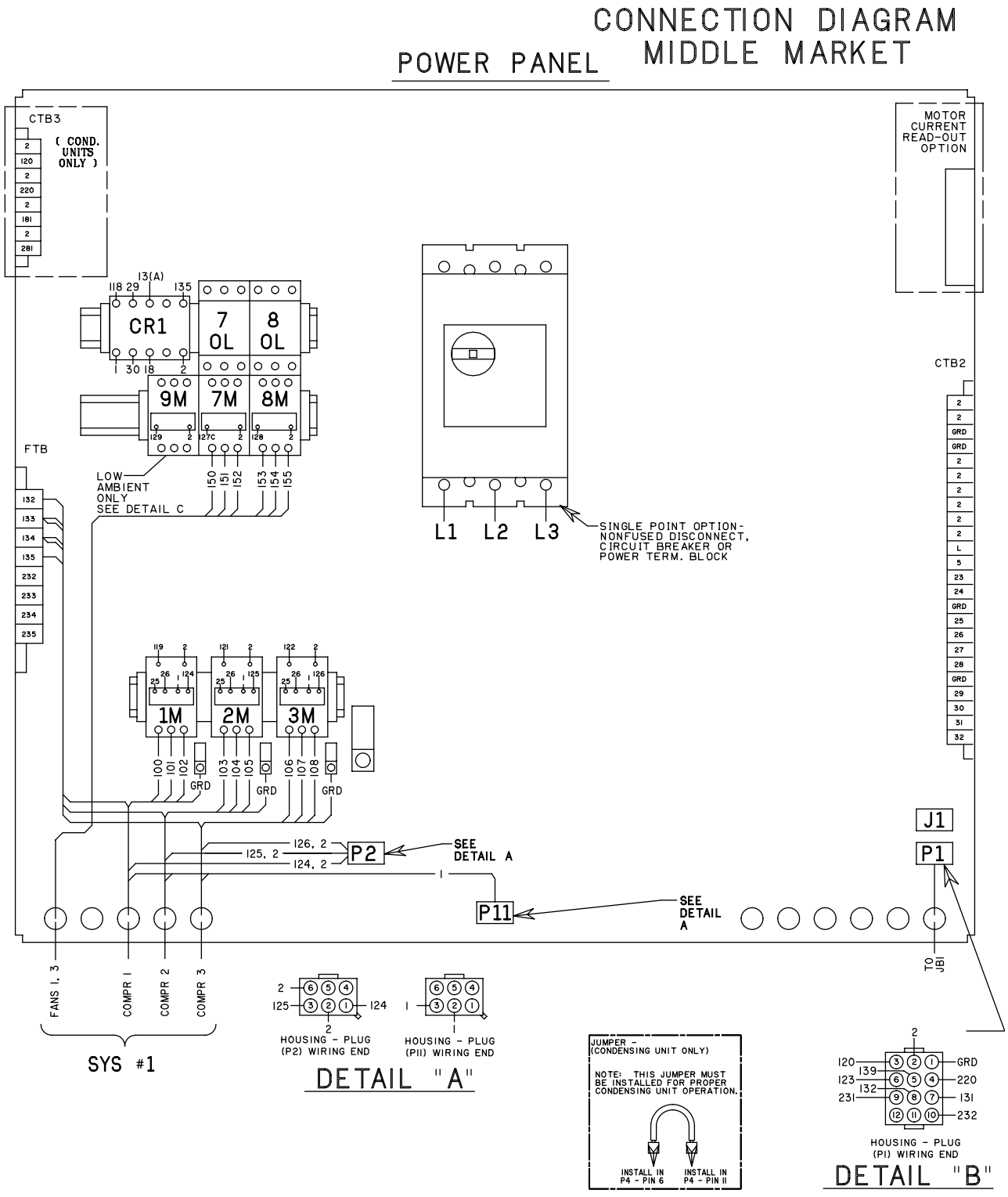




LD08945

FIG. 31 – ELEMENTARY DIAGRAM, MIDDLE MARKET - YCUL0040E_

CONNECTION DIAGRAM
YCUL0040E_

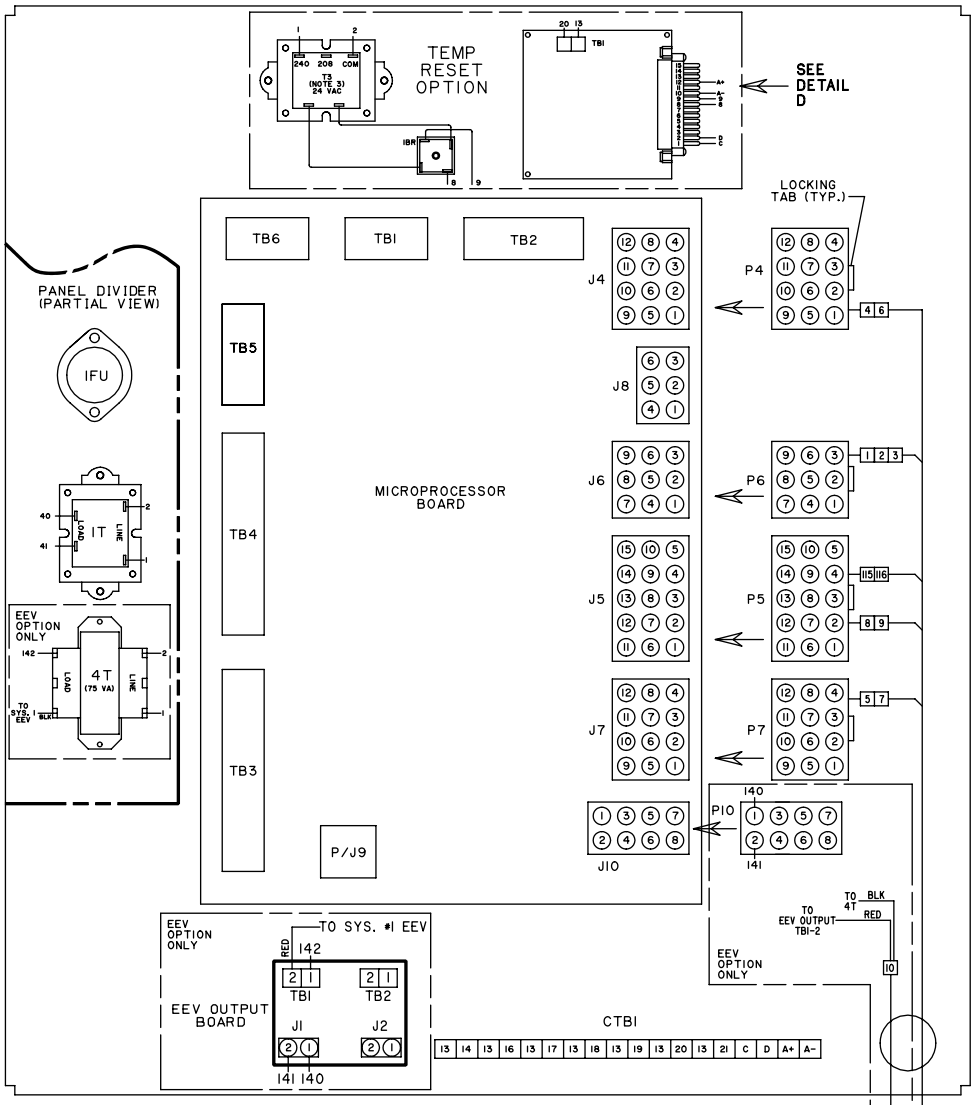


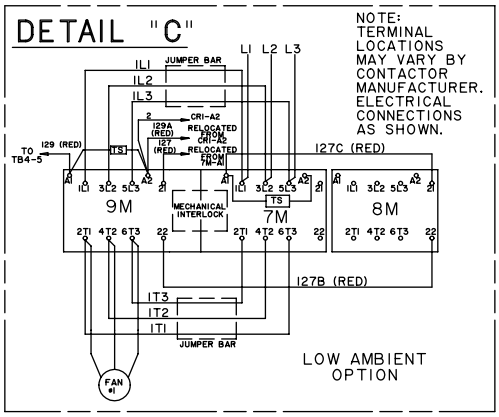
LD08944

FIG. 32 – CONNECTION DIAGRAM, MIDDLE MARKET - YCUL0040E_

035-19216-000
REV A

MICRO PANEL





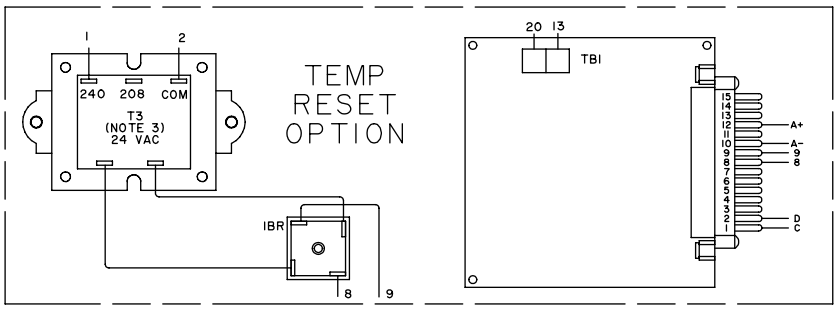


TABLE II

BOARD PLUG NO.	CABLE ITEM NO.	CABLE CODE	WIRE COLOR	PLUG PIN NO.	FUNCTION	LEGEND
MICRO P4	19	4	RED	5	SYS #1 SUCTION PRESSURE	ISPT
			WHT	10		
			BLK	1		
			DRAIN	2		
	(OPTIONAL KIT)	6	RED	7	SYS #1 DISCHARGE PRESSURE	IDPT
			WHT	12		
			BLK	8		
			DRAIN	9		
MICRO P6	19	1	BLK	5	LEAVING WATER TEMP	LWT
			RED	8		
			DRAIN	2		
	19	3	BLK	6	ENTERING WATER TEMP	EWT
			RED	9		
			DRAIN	3		
	19	2	BLK	4	OUTSIDE AIR TEMP.	OAT
			RED	7		
			DRAIN	1		
MICRO P5	STANDARD 407C	15	RED	12	SYS #1 LIQ. TEMP. SENSOR	ILTS
			BLK	7		
			DRAIN	2		
	(OPTIONAL KIT)	8	RED	14	SYS #1 SUCTION TEMP. SENSOR	ISTS
			BLK	9		
			DRAIN	4		
EEV OUTPUT BOARD AND TRANS FORMER 4T, 5T (OPTIONAL)	(OPTIONAL KIT)	10	BLK	4T (TRANS)	SYS #1 EEV OUTPUT	IEEV
			RED	EEV OUTPUT BOARD TBI-2		

NOTE: CABLES AND PLUGS (P4 & P6) ARE SUPPLIED IN KIT (ITEM 19)

LD08776

ELEMENTARY DIAGRAM
YCUL0046E_ – YCUL0066E_

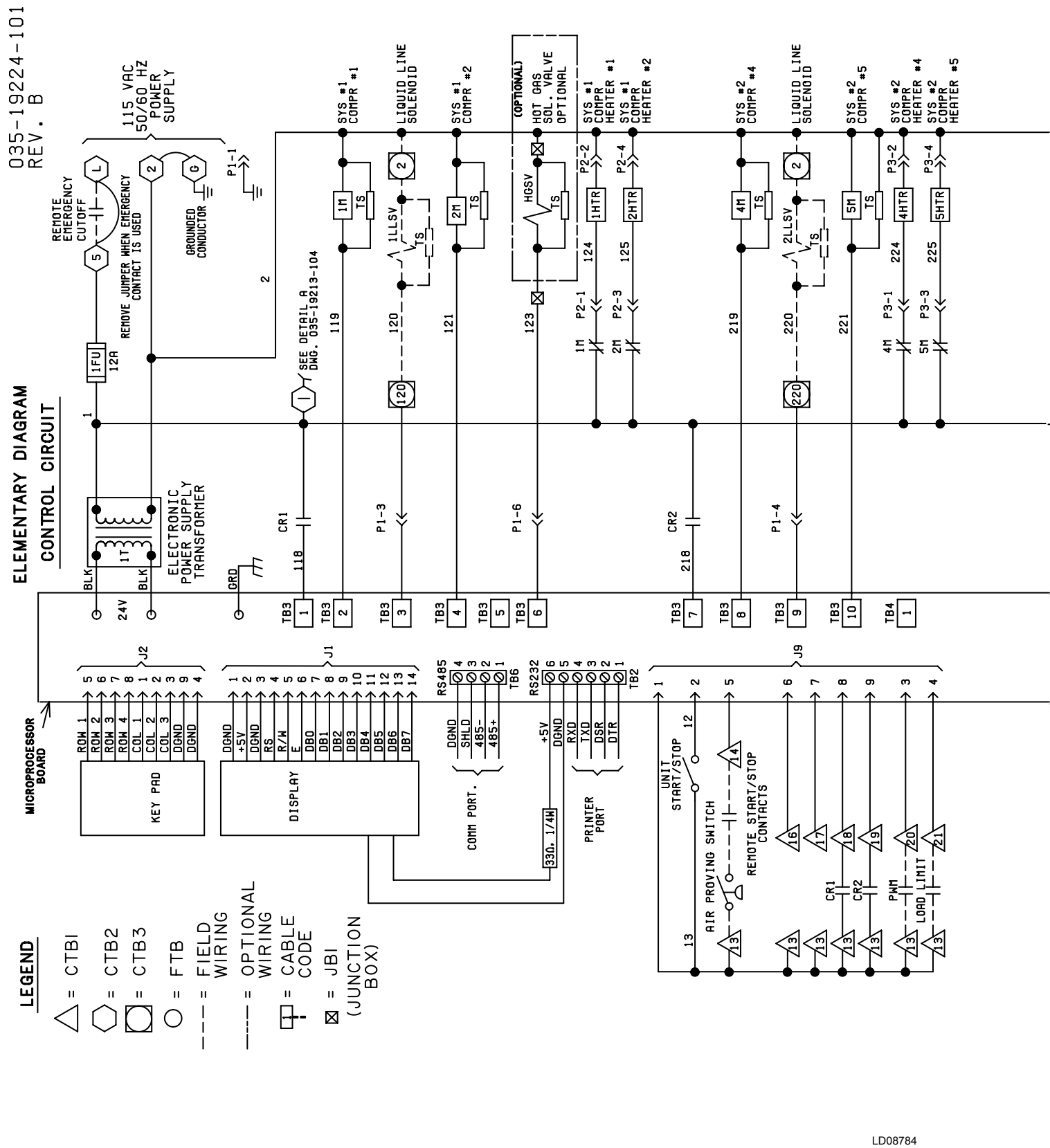
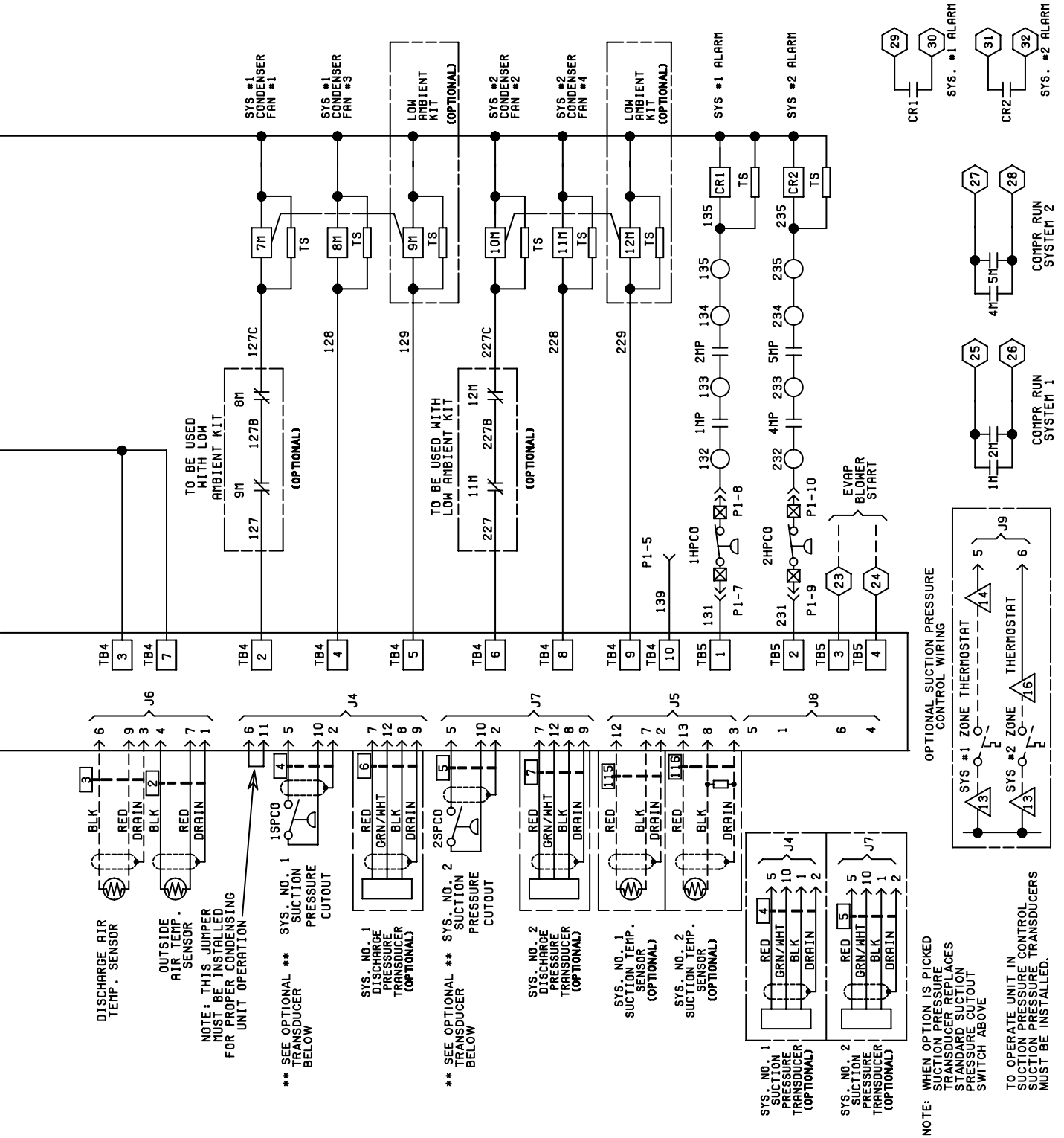
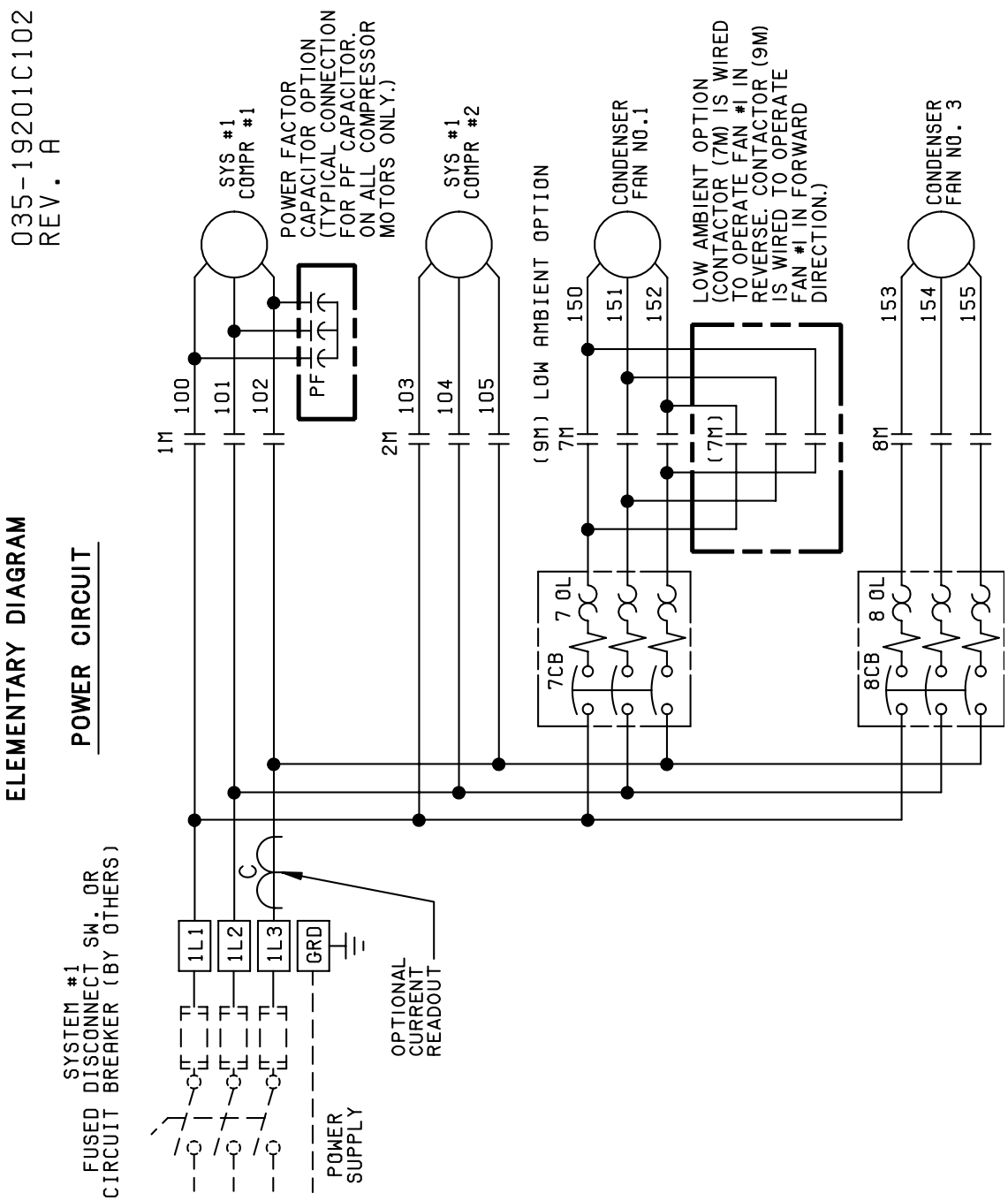


FIG. 33 – ELEMENTARY DIAGRAM, CONTROL CIRCUIT – YCUL0046E_ - YCUL0066E_


SYS #1 CONDENSER FAN #1
SYS #1 CONDENSER FAN #3
LOW AMBIENT KIT (OPTIONAL)
SYS #2 CONDENSER FAN #2
SYS #2 CONDENSER FAN #4
LOW AMBIENT KIT (OPTIONAL)
SYS #1 ALARM
SYS #2 ALARM
CR1
CR2
SYS. #1 ALARM
SYS. #2 ALARM
TO BE USED WITH LOW AMBIENT KIT
(OPTIONAL)
TO BE USED WITH LOW AMBIENT KIT
(OPTIONAL)
1HPCO
2HPCO
P1-5
P1-7
P1-8
P1-9
P1-10
EVAP BLOWER START
COMPR RUN SYSTEM 1
COMPR RUN SYSTEM 2
OPTIONAL SUCTION PRESSURE CONTROL WIRING
SYS #1 ZONE THERMOSTAT
SYS #2 ZONE THERMOSTAT
THERMOSTAT
DISCHARGE AIR TEMP. SENSOR
OUTSIDE AIR TEMP. SENSOR
NOTE: THIS JUMPER MUST BE INSTALLED FOR PROPER CONDENSING UNIT OPERATION
** SEE OPTIONAL ** SYS. NO. 1 SUCTION PRESSURE CUTOUT TRANSDUCER BELOW
** SEE OPTIONAL ** SYS. NO. 2 SUCTION PRESSURE CUTOUT TRANSDUCER BELOW
1SPCO
2SPCO
SYS. NO. 1 DISCHARGE PRESSURE TRANSDUCER (OPTIONAL)
SYS. NO. 2 DISCHARGE PRESSURE TRANSDUCER (OPTIONAL)
SYS. NO. 1 SUCTION TEMP. SENSOR (OPTIONAL)
SYS. NO. 2 SUCTION TEMP. SENSOR (OPTIONAL)
SYS. NO. 1 SUCTION PRESSURE TRANSDUCER (OPTIONAL)
SYS. NO. 2 SUCTION PRESSURE TRANSDUCER (OPTIONAL)
NOTE: WHEN OPTION IS PICKED SUCTION PRESSURE TRANSDUCER REPLACES STANDARD SUCTION PRESSURE CUTOUT SWITCH ABOVE
TO OPERATE UNIT IN SUCTION PRESSURE CONTROL MUST BE INSTALLED. SUCTION PRESSURE TRANSDUCERS

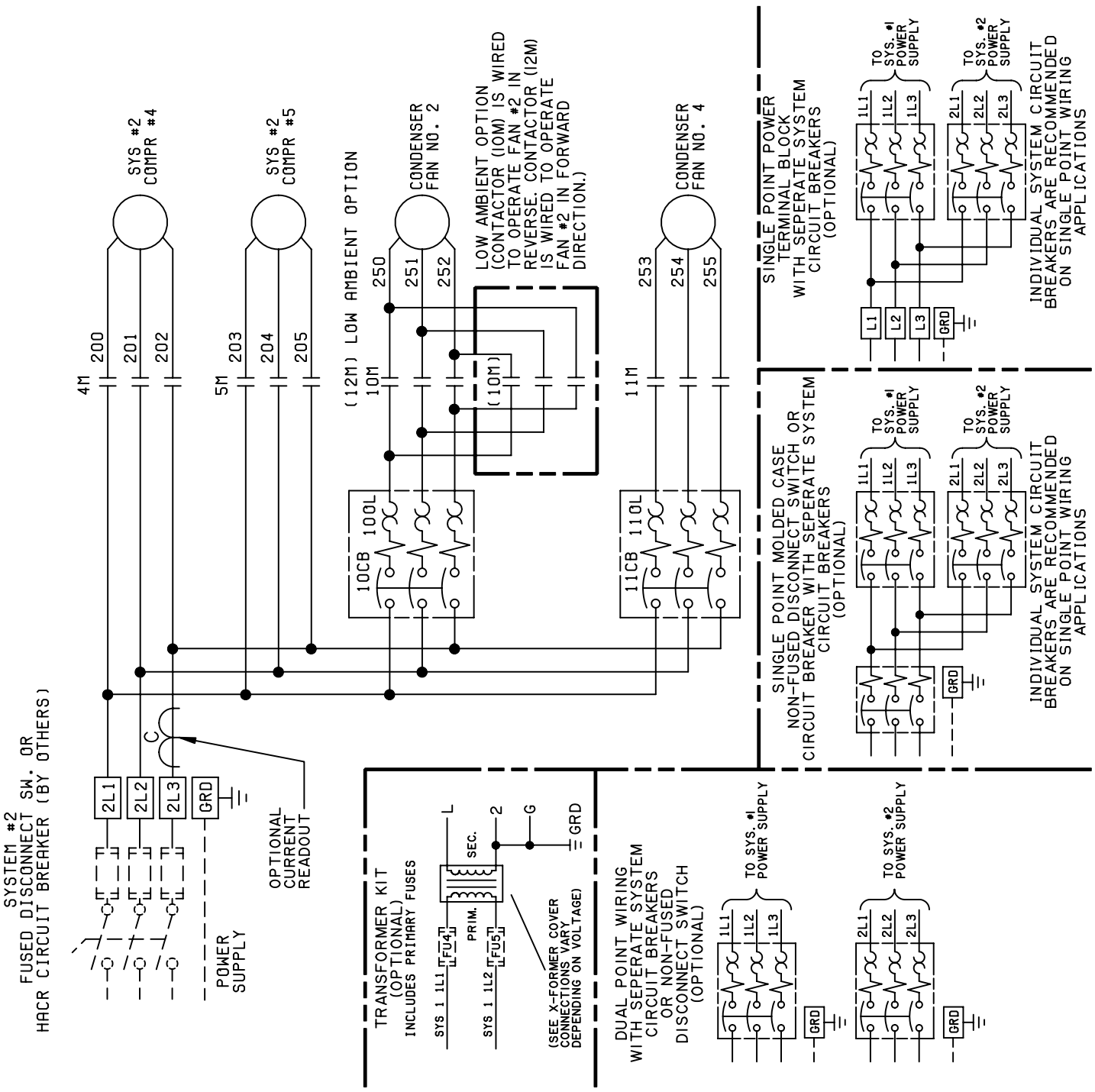
LD08804

ELEMENTARY DIAGRAM
YCUL0046E_ – YCUL0066E_



LD08802

FIG. 34 – ELEMENTARY DIAGRAM, POWER CIRCUIT – YCUL0046E_ - YCUL0066E_


SYSTEM #2
FUSED DISCONNECT SW. OR
HACR CIRCUIT BREAKER (BY OTHERS)
2L1
2L2
2L3
GRD
POWER SUPPLY
OPTIONAL CURRENT READOUT
C
4M
200
201
202
SYS #2 COMPR #4
5M
203
204
205
SYS #2 COMPR #5
(12M) LOW AMBIENT OPTION
10M
250
251
252
CONDENSER FAN NO. 2
(10M)
LOW AMBIENT OPTION (CONTACTOR (10M) IS WIRED TO OPERATE FAN #2 IN REVERSE. CONTACTOR (12M) IS WIRED TO OPERATE FAN #2 IN FORWARD DIRECTION.)
11M
253
254
255
CONDENSER FAN NO. 4
10CB 100L
11CB 110L
TRANSFORMER KIT (OPTIONAL)
INCLUDES PRIMARY FUSES
SYS 1 1L1
SYS 1 1L2
FU4
FU5
PRIM.
SEC.
L
2
G
GRD
(SEE X-FORMER COVER CONNECTIONS VARY DEPENDING ON VOLTAGE)
DUAL POINT WIRING WITH SEPERATE SYSTEM CIRCUIT BREAKERS OR NON-FUSED DISCONNECT SWITCH (OPTIONAL)
1L1
1L2
1L3
TO SYS. #1 POWER SUPPLY
2L1
2L2
2L3
TO SYS. #2 POWER SUPPLY
SINGLE POINT MOLDED CASE NON-FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER WITH SEPERATE SYSTEM CIRCUIT BREAKERS (OPTIONAL)
INDIVIDUAL SYSTEM CIRCUIT BREAKERS ARE RECOMMENDED ON SINGLE POINT WIRING APPLICATIONS
SINGLE POINT POWER TERMINAL BLOCK WITH SEPERATE SYSTEM CIRCUIT BREAKERS (OPTIONAL)
L1
L2
L3
GRD
INDIVIDUAL SYSTEM CIRCUIT BREAKERS ARE RECOMMENDED ON SINGLE POINT WIRING APPLICATIONS

LD08781

4

ELEMENTARY DIAGRAM
YCUL0046E_ – YCUL0066E_

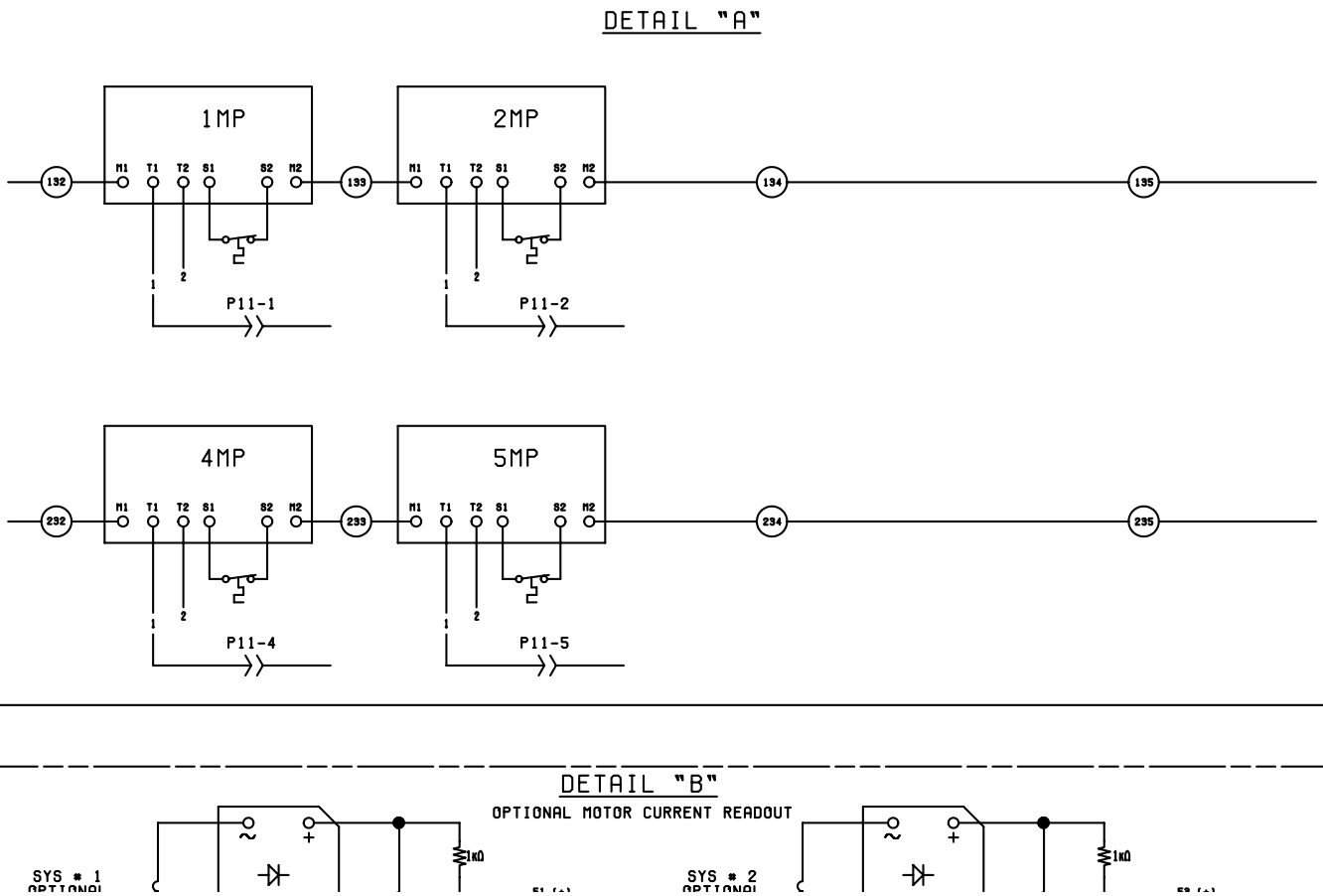
ELEMENTARY DIAGRAM
MIDDLE MARKET
STANDARD AND REMOTE EVAPORATOR UNITS

035-19213-104
REV. B

NOTES:
1. FIELD WIRING TO BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS ALL OTHER APPLICABLE CODES AND SPECIFICATIONS.
2. CONTACTS MUST BE SUITABLE FOR SWITCHING 24VDC, (GOLD CONTACTS RECOMMENDED). WIRING SHALL NOT BE RUN IN THE SAME CONDUIT WITH ANY LINE VOLTAGE (CLASS I) WIRING.
3. TO CYCLE UNIT ON AND OFF AUTOMATICALLY WITH CONTACT SHOWN, INSTALL A CYCLING DEVICE IN SERIES WITH THE FLOW SWITCH. SEE NOTE 2 FOR CONTACT RATING AND WIRING SPECIFICATIONS.
4. TO STOP UNIT (EMERGENCY STOP) WITH CONTACTS OTHER THAN THOSE SHOWN, INSTALL THE STOP CONTACT BETWEEN TERMINALS 5 AND 1. IF A STOP DEVICE IS NOT INSTALLED, A JUMPER MUST BE CONNECTED BETWEEN TERMINALS 5 AND 1. DEVICE MUST HAVE A MINIMUM CONTACT RATING OF 6A AT 115VOLTS A.C.
5. CONTACTS ARE RATED AT 115V, 100VA, RESISTIVE LOAD ONLY, AND MUST BE SUPPRESSED AT LOAD BY USER.
6. SEE INSTALLATION, OPERATION AND MAINTENANCE MANUAL WHEN OPTIONAL EQUIPMENT IS USED.
7. OPTIONAL CURRENT READOUT. 5V = 225A.
8. 1MP THRU 6MP ARE CONTAINED IN THEIR RESPECTIVE COMPRESSOR JUNCTION BOXES.

LEGEND

TS	TRANSIENT VOLTAGE SUPRESSION
⬡	TERMINAL BLOCK FOR CUSTOMER CONNECTIONS
△	TERMINAL BLOCK FOR CUSTOMER LOW VOLTAGE (CLASS 2) CONNECTIONS. SEE NOTE 2.
◯	TERMINAL BLOCK FOR YORK CONNECTIONS ONLY
———	WIRING AND COMPONENTS BY YORK
—–—–	OPTIONAL EQUIPMENT
— — —	WIRING AND/OR COMPONENTS BY OTHERS



LD08783

FIG. 35 – ELEMENTARY DIAGRAM, MIDDLE MARKET – YCUL0046E_ - YCUL0066E_

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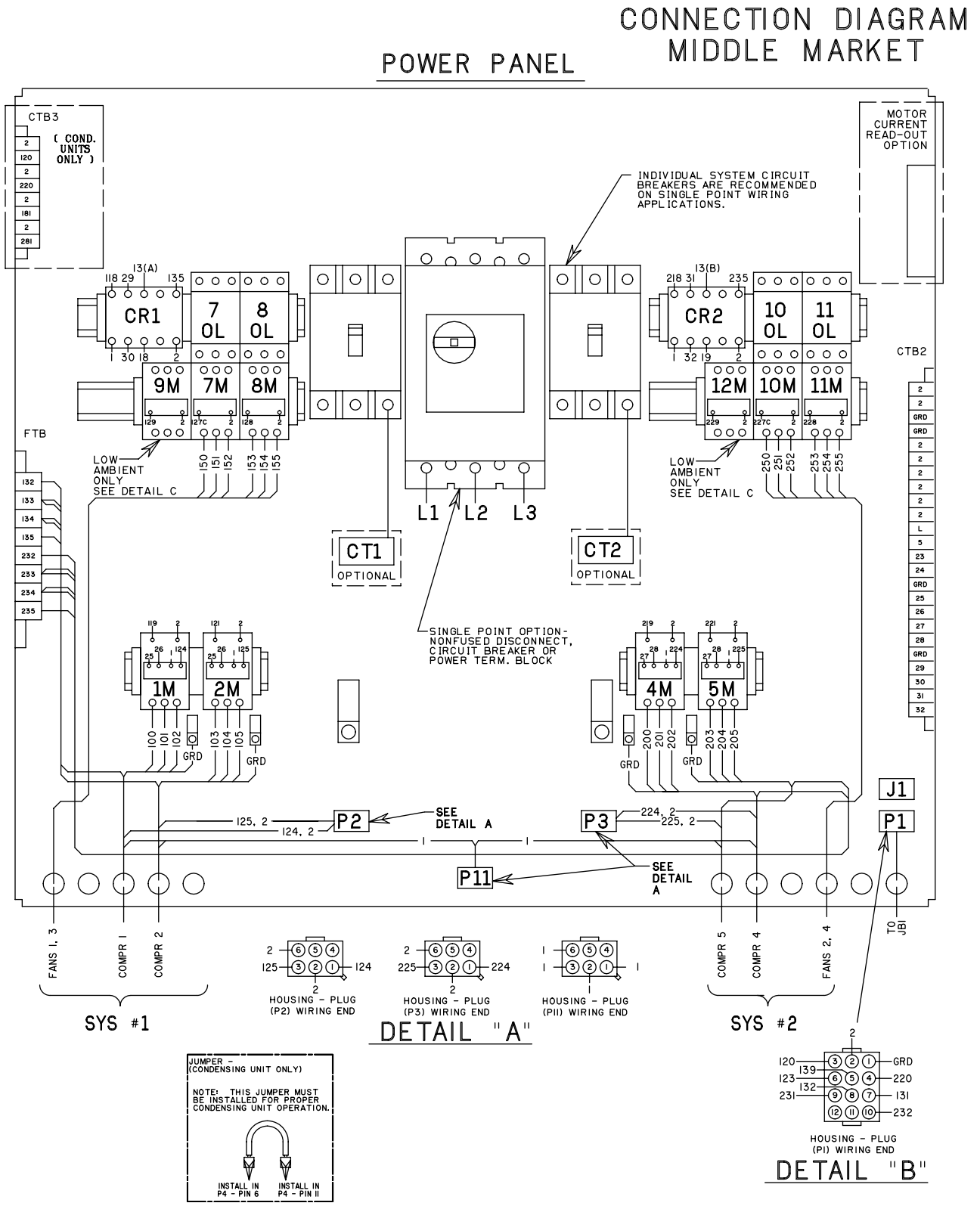
CONNECTION DIAGRAM
YCUL0046E_ – YCUL0066E_



LD08782

FIG. 36 – CONNECTION DIAGRAM, MIDDLE MARKET – YCUL0046E_ - YCUL0066E_

035-19212-000
REV A

MICRO PANEL

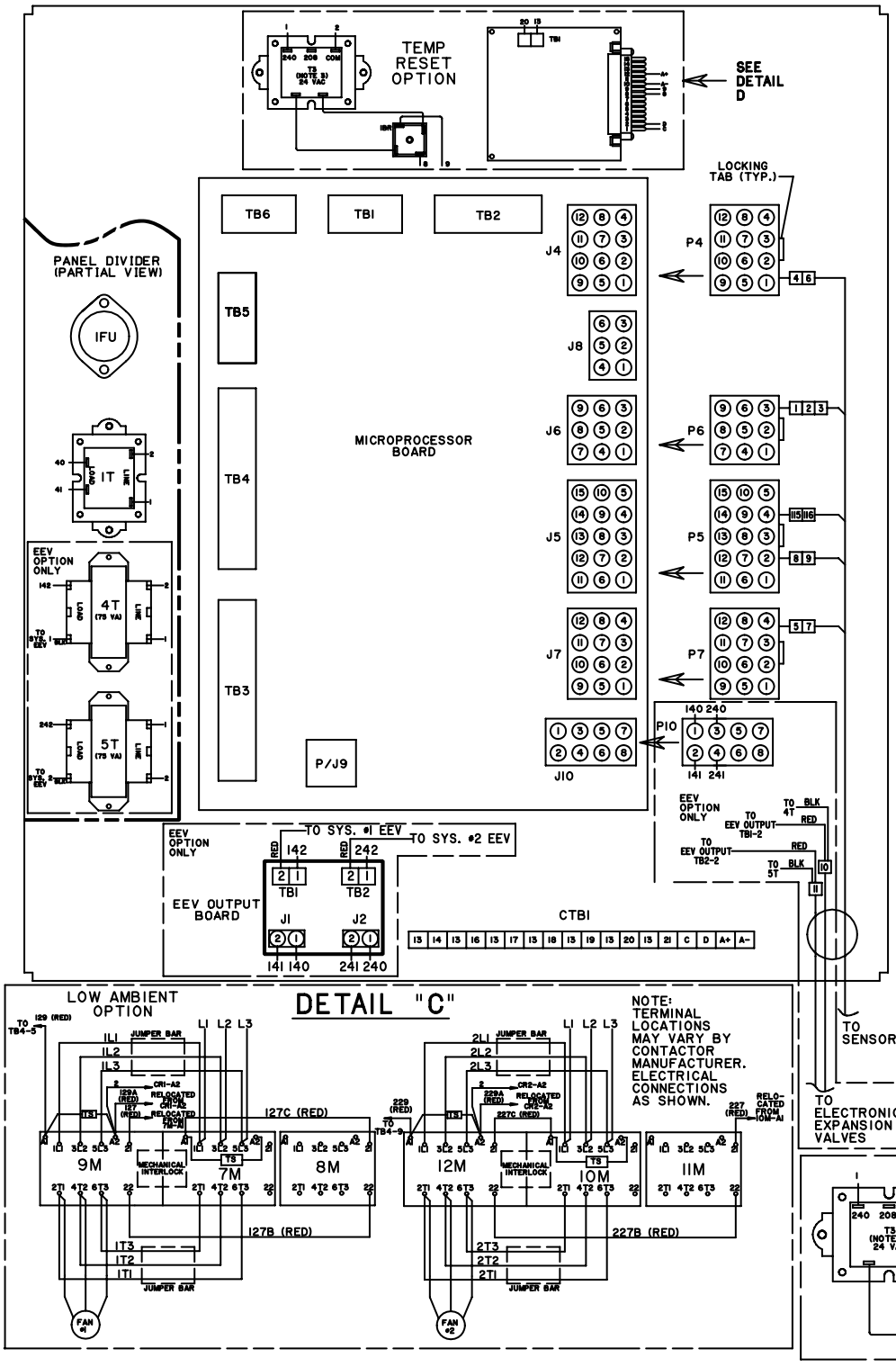


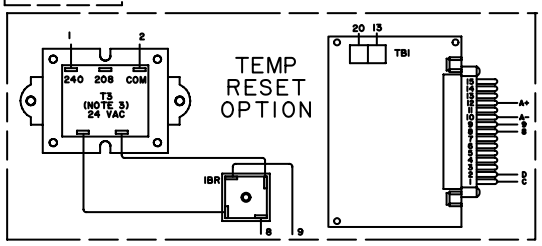
TABLE II

BOARD PLUG NO.	CABLE ITEM NO.	CABLE CODE	WIRE COLOR	PLUG PIN NO.	FUNCTION	LEGEND
MICRO P4	19	4	RED	5	SYS #1 SUCTION PRESSURE	ISPT
			WHT	10		
			BLK	1		
			DRAIN	2		
	(OPTIONAL KIT)	6	RED	7	SYS #1 DISCHARGE PRESSURE	IDPT
			WHT	12		
			BLK	8		
			DRAIN	9		
MICRO P6	19	1	BLK	5	LEAVING WATER TEMP	LWT
			RED	8		
			DRAIN	2		
	19	3	BLK	6	ENTERING WATER TEMP	EWT
			RED	9		
			DRAIN	3		
	19	2	BLK	4	OUTSIDE AIR TEMP.	OAT
			RED	7		
			DRAIN	1		
MICRO P7	19	5	RED	5	SYS #2 SUCTION PRESSURE	2SPT
			WHT	10		
			BLK	1		
			DRAIN	2		
	(OPTIONAL KIT)	7	RED	7	SYS #2 DISCHARGE PRESSURE	2DPT
			WHT	12		
			BLK	8		
			DRAIN	9		
MICRO P5	STANDARD 407C	15	RED	12	SYS #1 LIQ. TEMP. SENSOR	ILTS
			BLK	7		
			DRAIN	2		
	STANDARD 407C	16	RED	13	SYS #2 LIQ. TEMP. SENSOR	2LTS
			BLK	8		
			DRAIN	3		
	(OPTIONAL KIT)	8	RED	14	SYS #1 SUCTION TEMP. SENSOR	ISTS
			BLK	9		
			DRAIN	4		
	(OPTIONAL KIT)	9	RED	15	SYS #2 SUCTION TEMP. SENSOR	2STS
			BLK	10		
			DRAIN	5		
EEV OUTPUT BOARD AND TRANS FORMER 4T, 5T (OPTIONAL)	(OPTIONAL KIT)	10	BLK	4T (TRANS)	SYS #1 EEV OUTPUT	IEEV
			RED	EEV OUTPUT BOARD TB1-2		
	(OPTIONAL KIT)	11	BLK	5T (TRANS)	SYS #2 EEV OUTPUT	2EEV
			RED	EEV OUTPUT BOARD TB2-2		

NOTE: CABLES AND PLUGS (P4, P6 & P7) ARE SUPPLIED IN KIT (ITEM 19)

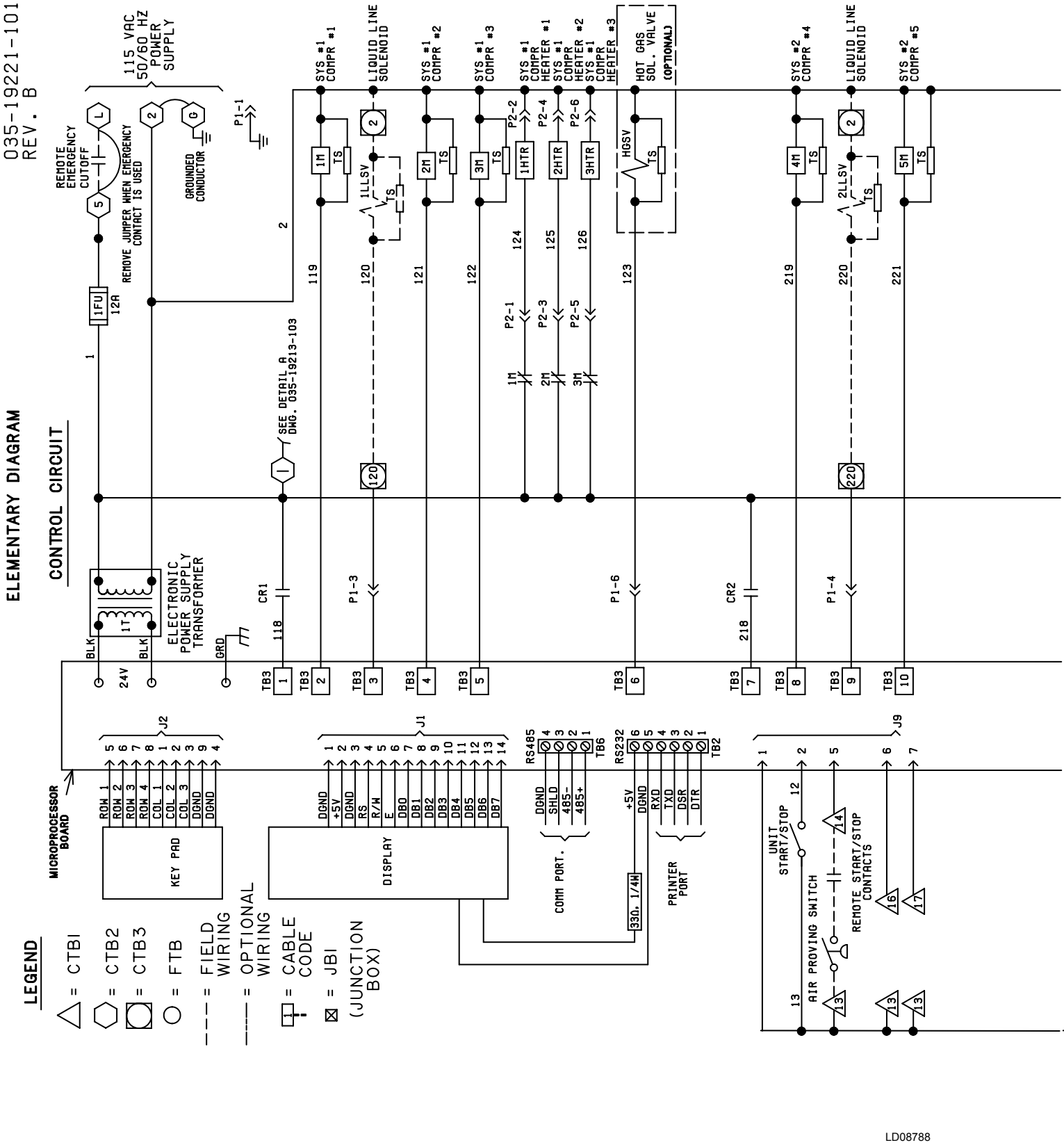
DETAIL "C"

DETAIL "D"



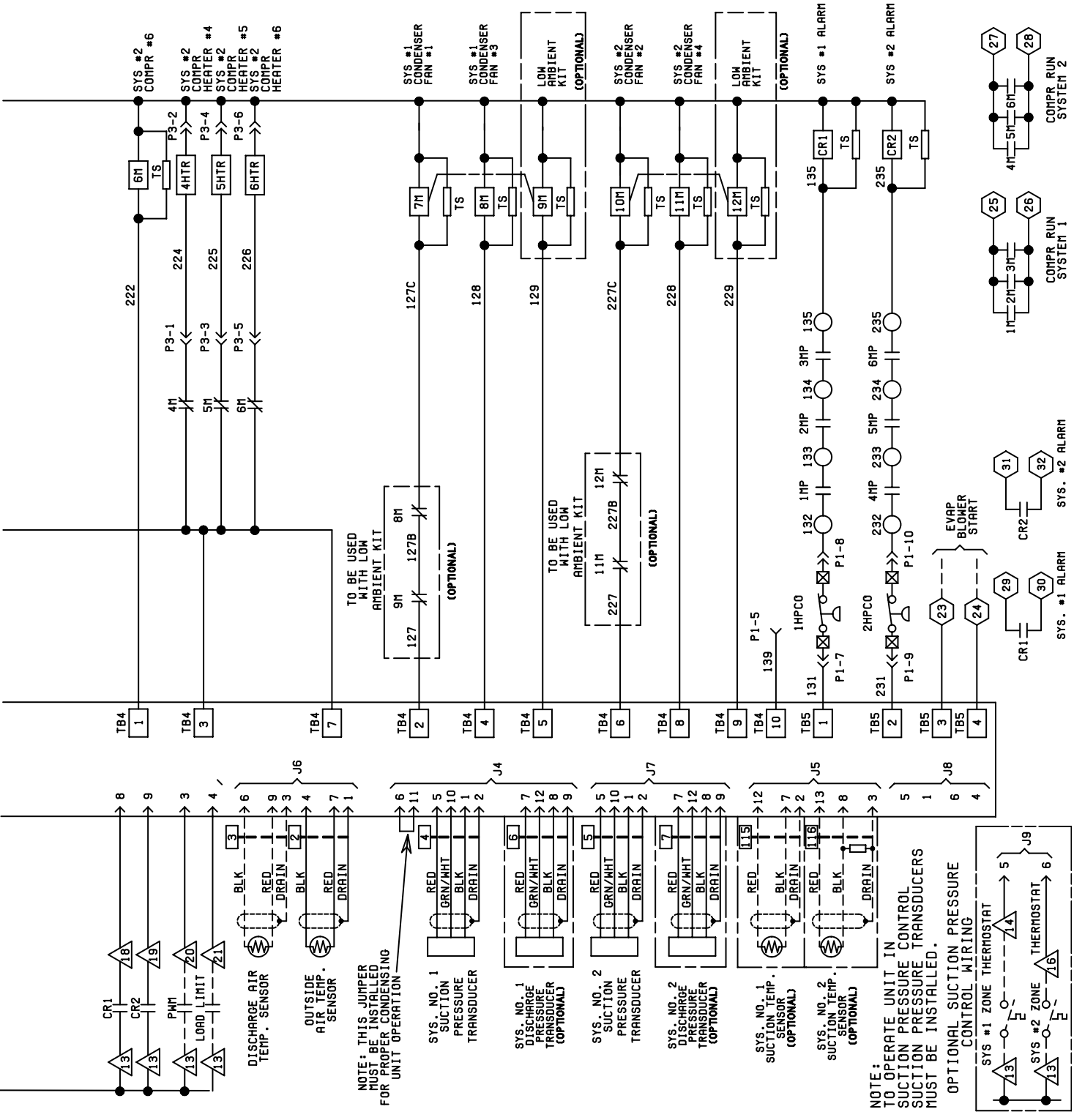
LD08803

ELEMENTARY DIAGRAM
YCUL0076E_ – YCUL0090E_



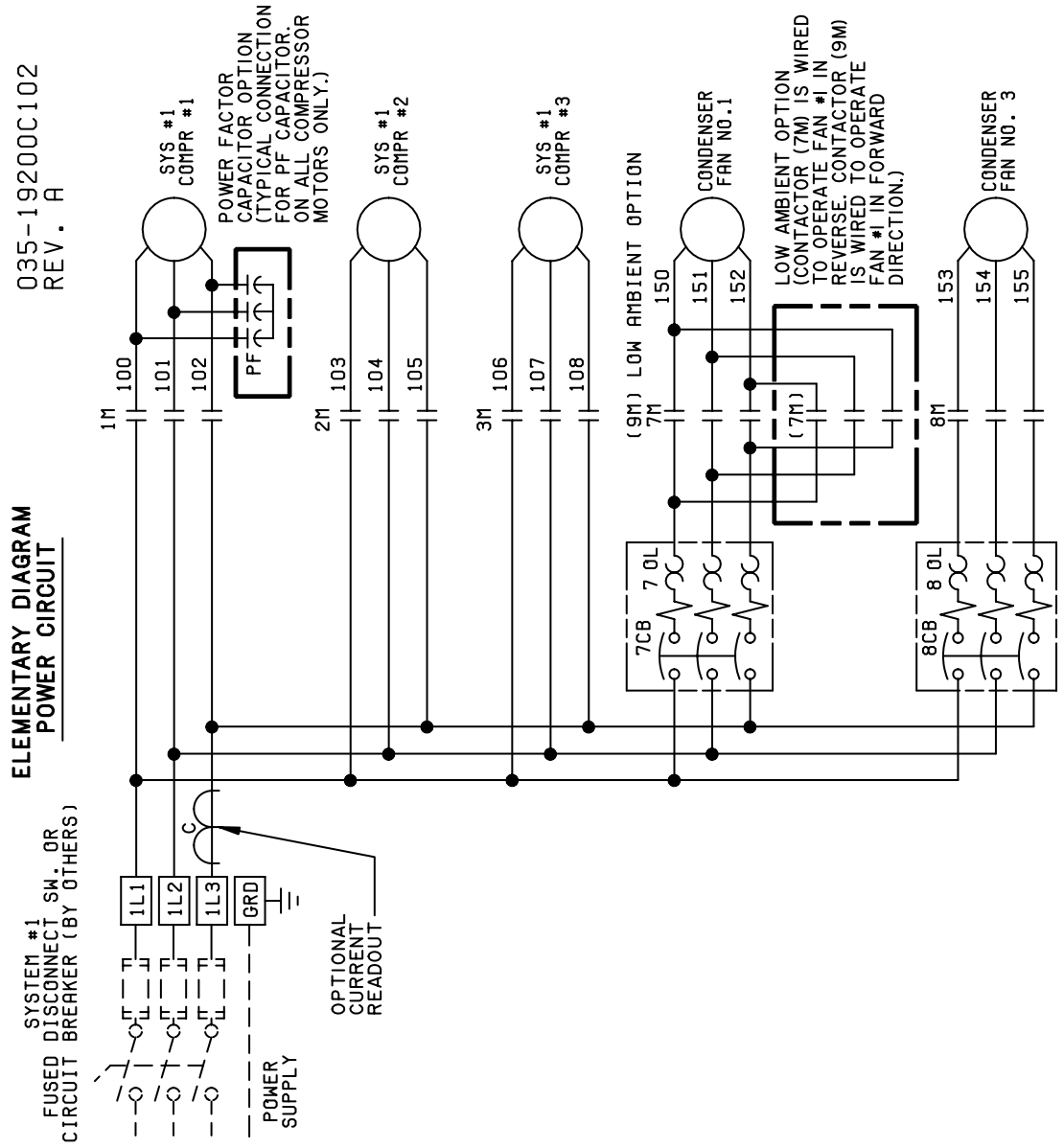
LD08788

FIG. 37 – ELEMENTARY DIAGRAM, CONTROL CIRCUIT – YCUL0076E_ - YCUL0090E_


SYS #2 COMPR #6
SYS #2 COMPR HEATER #4
SYS #2 COMPR HEATER #5
SYS #2 COMPR HEATER #6
SYS #1 CONDENSER FAN #1
SYS #1 CONDENSER FAN #3
LOW AMBIENT KIT (OPTIONAL)
SYS #2 CONDENSER FAN #2
SYS #2 CONDENSER FAN #4
LOW AMBIENT KIT (OPTIONAL)
SYS #1 ALARM
SYS #2 ALARM
6M
4HTR
5HTR
6HTR
7M
8M
9M
10M
11M
12M
CR1
CR2
TS
P3-1
P3-2
P3-3
P3-4
P3-5
P3-6
4M
5M
6M
222
224
225
226
127C
128
129
227C
228
229
135
235
1M
2M
3M
5M
6M
COMPR RUN SYSTEM 1
COMPR RUN SYSTEM 2
TO BE USED WITH LOW AMBIENT KIT
9M
127B
127
(OPTIONAL)
11M
227B
227
12M
1HPCO
2HPCO
P1-5
P1-7
P1-8
P1-9
P1-10
1MP
2MP
3MP
4MP
5MP
6MP
132
133
134
232
233
234
131
231
139
EVAP BLOWER START
SYS. #1 ALARM
SYS. #2 ALARM
CR1
CR2
TB4
TB5
J4
J5
J6
J7
J8
J9
BLK
RED
DRAIN
GRN/WHT
DISCHARGE AIR TEMP. SENSOR
OUTSIDE AIR TEMP. SENSOR
NOTE: THIS JUMPER MUST BE INSTALLED FOR PROPER CONDENSING UNIT OPERATION
SYS. NO. 1 SUCTION PRESSURE TRANSDUCER
SYS. NO. 1 DISCHARGE PRESSURE TRANSDUCER (OPTIONAL)
SYS. NO. 2 SUCTION PRESSURE TRANSDUCER
SYS. NO. 2 DISCHARGE PRESSURE TRANSDUCER (OPTIONAL)
SYS. NO. 1 SUCTION TEMP. SENSOR (OPTIONAL)
SYS. NO. 2 SUCTION TEMP. SENSOR (OPTIONAL)
NOTE:
TO OPERATE UNIT IN SUCTION PRESSURE CONTROL SUCTION PRESSURE TRANSDUCERS MUST BE INSTALLED.
OPTIONAL SUCTION PRESSURE CONTROL WIRING
SYS #1 ZONE THERMOSTAT
SYS #2 ZONE THERMOSTAT
CR1
CR2
PWM
LOAD LIMIT

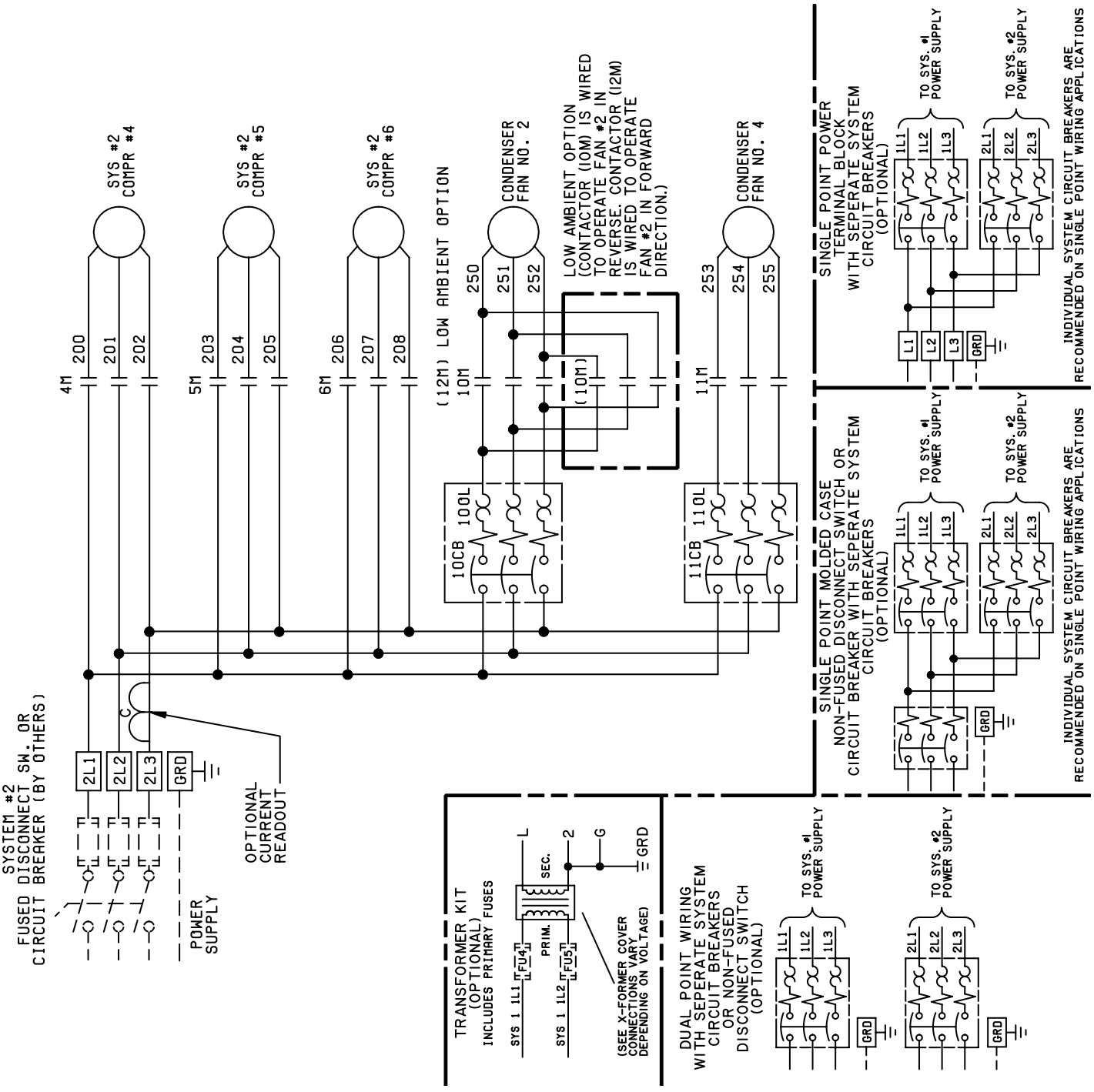
LD08807

ELEMENTARY DIAGRAM
YCUL0076E_ – YCUL0090E_



LD08805

FIG. 38 – ELEMENTARY DIAGRAM, POWER CIRCUIT – YCUL0076E_ - YCUL0090E_


SYSTEM #2
FUSED DISCONNECT SW. OR
CIRCUIT BREAKER (BY OTHERS)
2L1
2L2
2L3
GRD
POWER
SUPPLY
OPTIONAL
CURRENT
READOUT
4M
200
201
202
SYS #2
COMPR #4
5M
203
204
205
SYS #2
COMPR #5
6M
206
207
208
SYS #2
COMPR #6
(12M) LOW AMBIENT OPTION
10M
250
251
252
CONDENSER
FAN NO. 2
LOW AMBIENT OPTION
(CONTACTOR (10M) IS WIRED
TO OPERATE FAN #2 IN
REVERSE. CONTACTOR (12M)
IS WIRED TO OPERATE
FAN #2 IN FORWARD
DIRECTION.)
(10M)
10CB
10OL
11M
253
254
255
CONDENSER
FAN NO. 4
11CB
11OL
SINGLE POINT POWER
TERMINAL BLOCK
WITH SEPERATE SYSTEM
CIRCUIT BREAKERS
(OPTIONAL)
L1
L2
L3
GRD
1L1
1L2
1L3
2L1
2L2
2L3
TO SYS. #1
POWER SUPPLY
TO SYS. #2
POWER SUPPLY
INDIVIDUAL SYSTEM CIRCUIT BREAKERS ARE
RECOMMENDED ON SINGLE POINT WIRING APPLICATIONS
SINGLE POINT MOLDED CASE
NON-FUSED DISCONNECT SWITCH OR
CIRCUIT BREAKER WITH SEPERATE SYSTEM
CIRCUIT BREAKERS
(OPTIONAL)
TRANSFORMER KIT
(OPTIONAL)
INCLUDES PRIMARY FUSES
SYS 1 1L1
SYS 1 1L2
FU4
FU5
PRIM.
SEC.
L
2
G
GRD
(SEE X-FORMER COVER
CONNECTIONS VARY
DEPENDING ON VOLTAGE)
DUAL POINT WIRING
WITH SEPERATE SYSTEM
CIRCUIT BREAKERS
OR NON-FUSED
DISCONNECT SWITCH
(OPTIONAL)

LD08785

4

ELEMENTARY DIAGRAM
YCUL0076E_ – YCUL0090E_

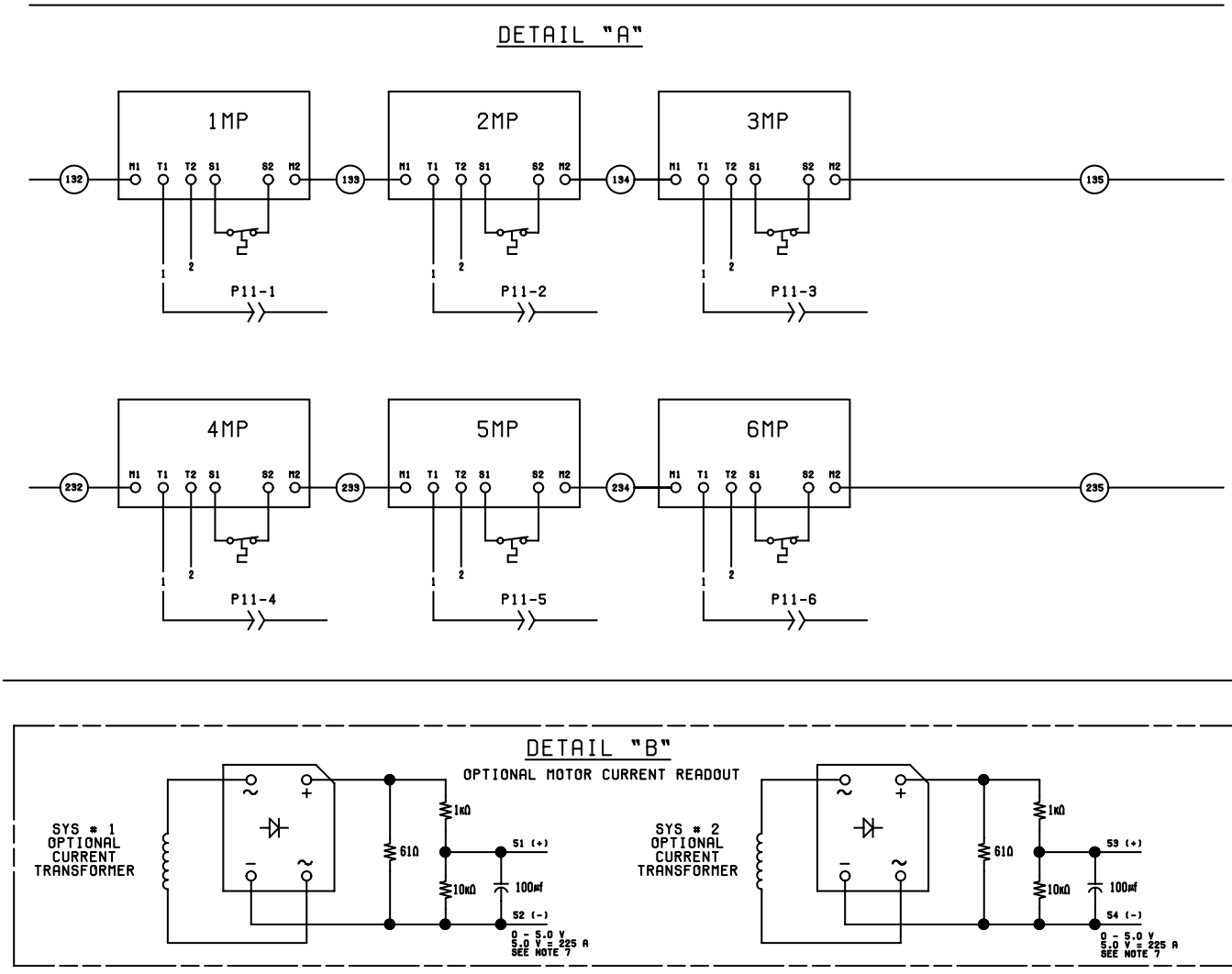
ELEMENTARY DIAGRAM
MIDDLE MARKET
STANDARD AND REMOTE EVAPORATOR UNITS

035-19213-103
REV. B

NOTES:
1. FIELD WIRING TO BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS ALL OTHER APPLICABLE CODES AND SPECIFICATIONS.
2. CONTACTS MUST BE SUITABLE FOR SWITCHING 24VDC, (GOLD CONTACTS RECOMMENDED). WIRING SHALL NOT BE RUN IN THE SAME CONDUIT WITH ANY LINE VOLTAGE (CLASS I) WIRING.
3. TO CYCLE UNIT ON AND OFF AUTOMATICALLY WITH CONTACT SHOWN, INSTALL A CYCLING DEVICE IN SERIES WITH THE FLOW SWITCH. SEE NOTE 2 FOR CONTACT RATING AND WIRING SPECIFICATIONS.
4. TO STOP UNIT (EMERGENCY STOP) WITH CONTACTS OTHER THAN THOSE SHOWN, INSTALL THE STOP CONTACT BETWEEN TERMINALS 5 AND 1. IF A STOP DEVICE IS NOT INSTALLED, A JUMPER MUST BE CONNECTED BETWEEN TERMINALS 5 AND 1. DEVICE MUST HAVE A MINIMUM CONTACT RATING OF 6A AT 115VOLTS A.C.
5. CONTACTS ARE RATED AT 115V, 100VA, RESISTIVE LOAD ONLY, AND MUST BE SUPPRESSED AT LOAD BY USER.
6. SEE INSTALLATION, OPERATION AND MAINTENANCE MANUAL WHEN OPTIONAL EQUIPMENT IS USED.
7. OPTIONAL CURRENT READOUT. 5V = 225A.
8. 1MP THRU 6MP ARE CONTAINED IN THEIR RESPECTIVE COMPRESSOR JUNCTION BOXES.

LEGEND

TS	TRANSIENT VOLTAGE SUPRESSION
⬡	TERMINAL BLOCK FOR CUSTOMER CONNECTIONS
△	TERMINAL BLOCK FOR CUSTOMER LOW VOLTAGE (CLASS 2) CONNECTIONS. SEE NOTE 2.
○	TERMINAL BLOCK FOR YORK CONNECTIONS ONLY
———	WIRING AND COMPONENTS BY YORK
——-——	OPTIONAL EQUIPMENT
— — —	WIRING AND/OR COMPONENTS BY OTHERS



LD08786

FIG. 39 – ELEMENTARY DIAGRAM, MIDDLE MARKET – YCUL0076E_ - YCUL0090E_

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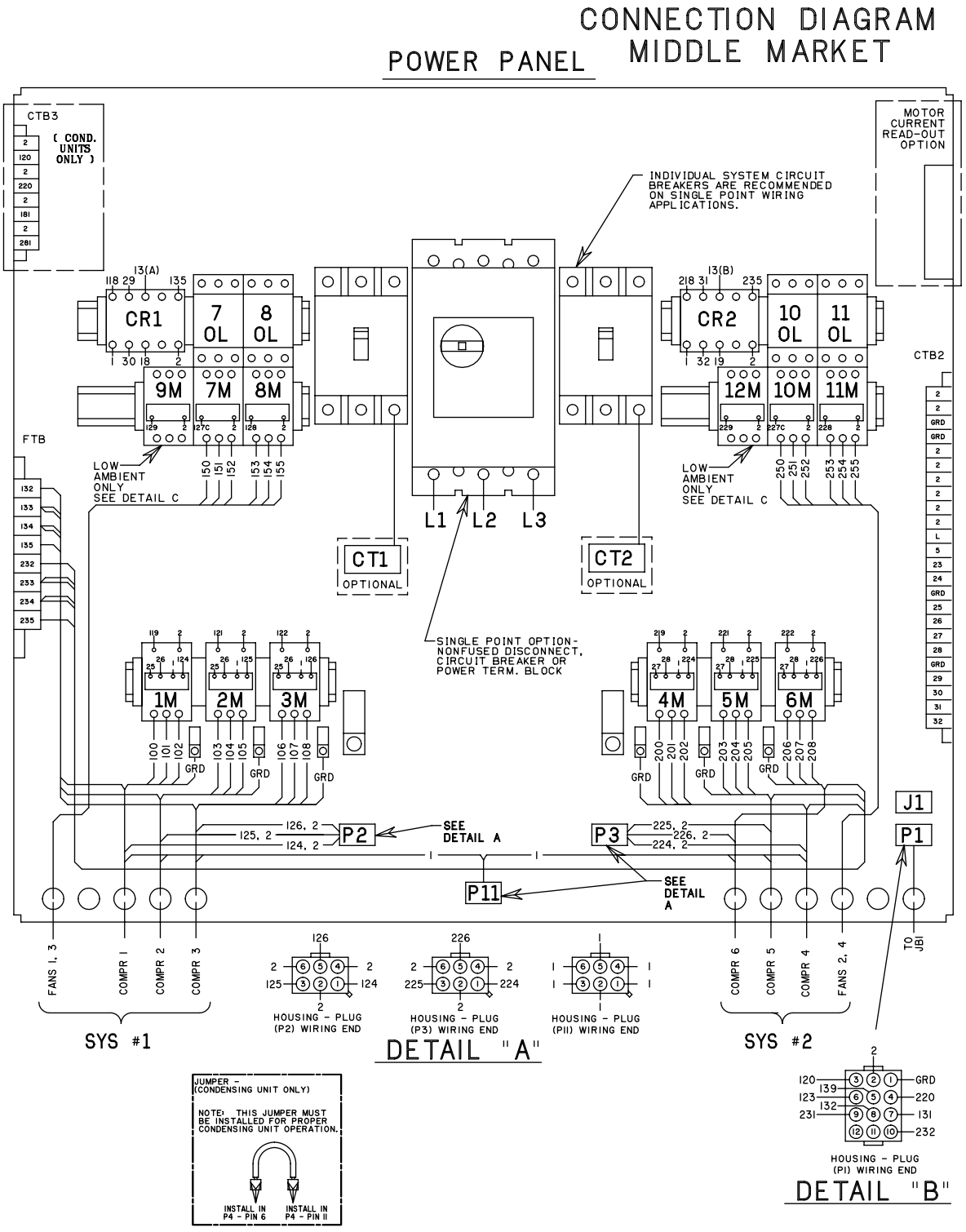
CONNECTION DIAGRAM
YCUL0076E_ – YCUL0090E_



LD08787

FIG. 40 – CONNECTION DIAGRAM, MIDDLE MARKET – YCUL0076E_ - YCUL0090E_

035-19214-000
REV A

MICRO PANEL

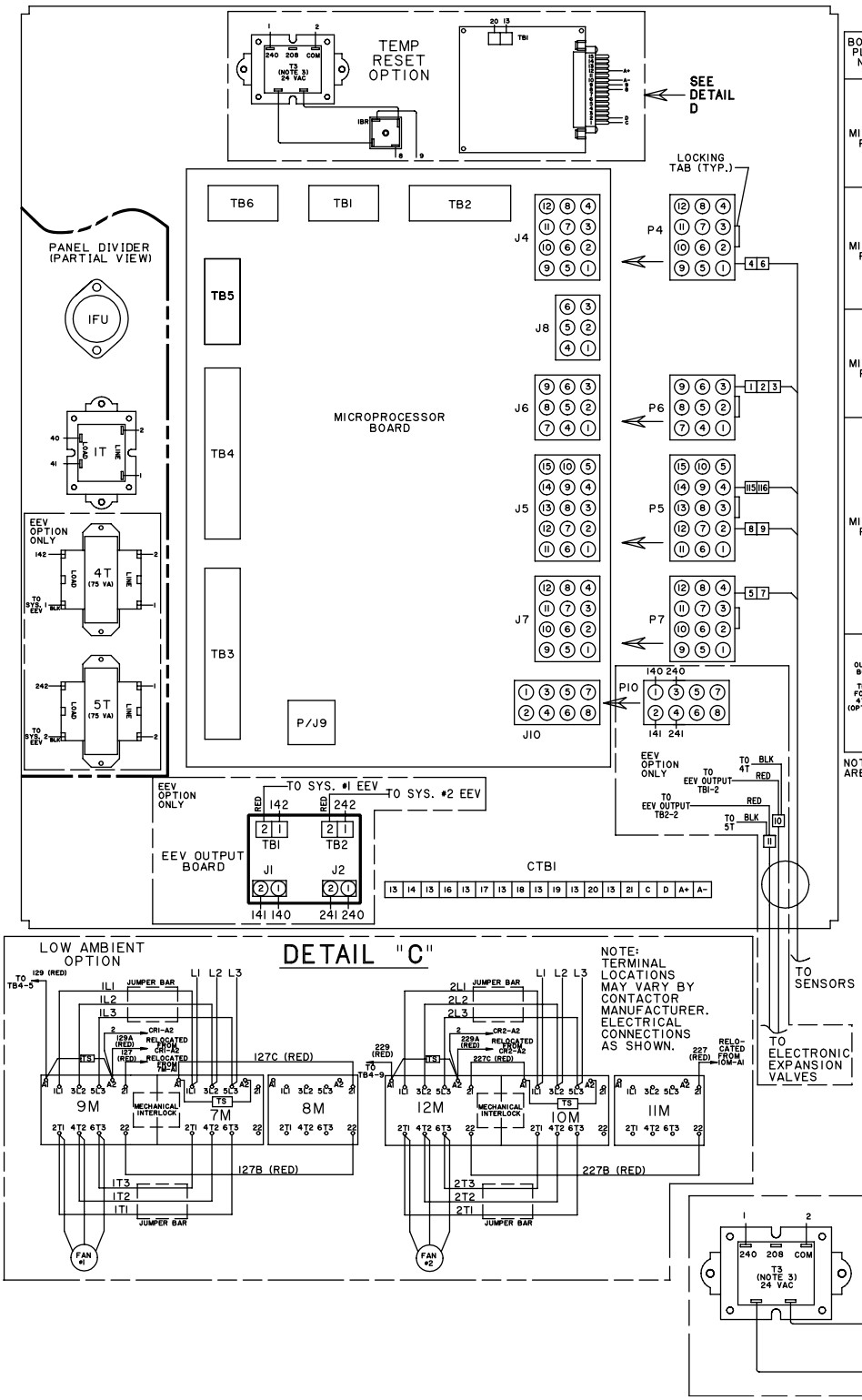
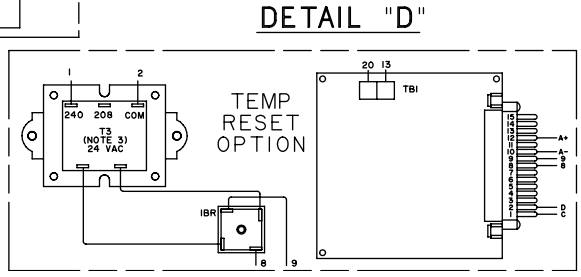


TABLE II

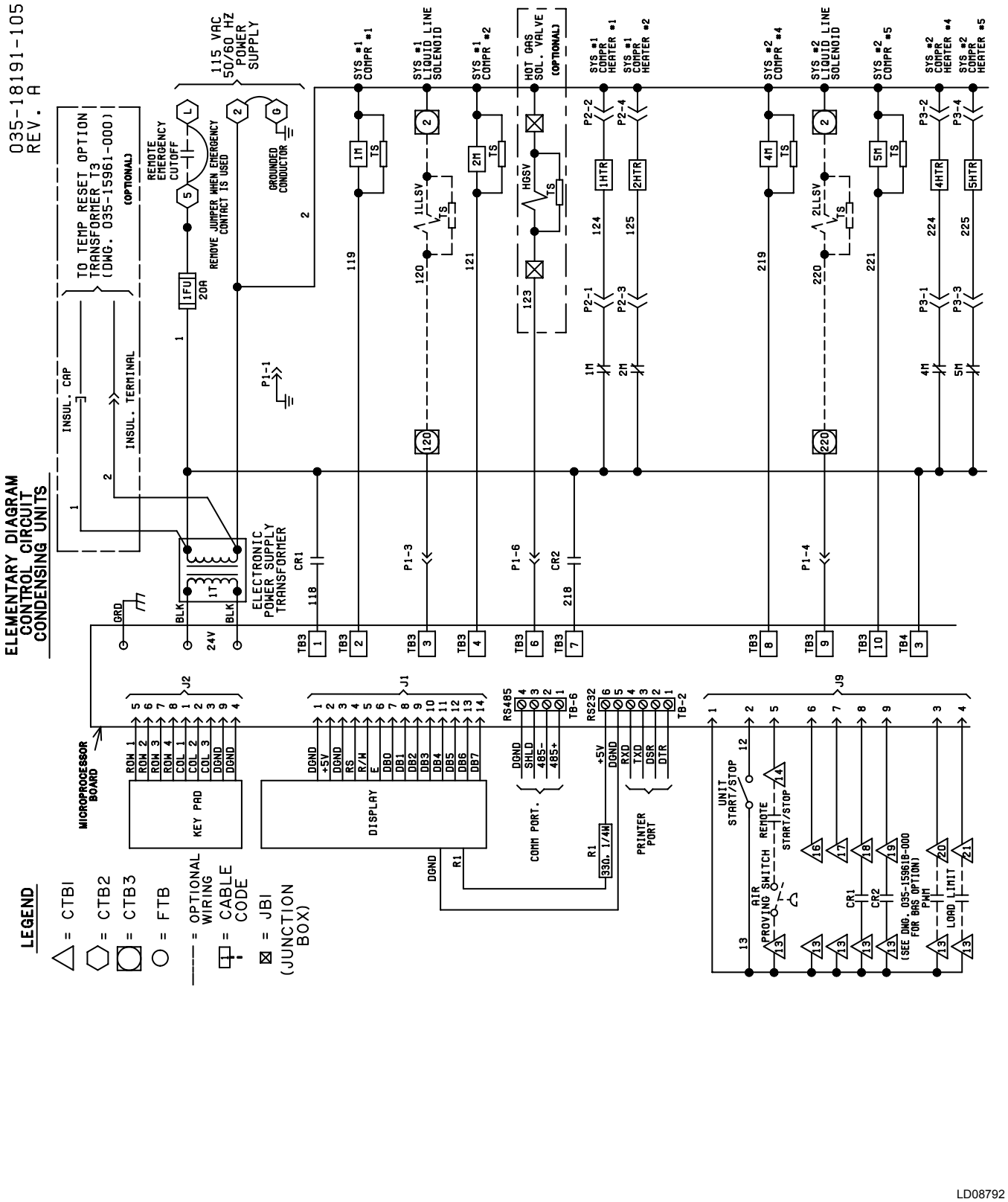
BOARD PLUG NO.	CABLE ITEM NO.	CABLE CODE	WIRE COLOR	PLUG PIN NO.	FUNCTION	LEGEND
MICRO P4	19	4	RED	5	SYS #1 SUCTION PRESSURE	ISPT
			WHT	10		
			BLK	1		
			DRAIN	2		
	(OPTIONAL KIT)	6	RED	7	SYS #1 DISCHARGE PRESSURE	IDPT
			WHT	12		
			BLK	8		
			DRAIN	9		
MICRO P6	19	1	BLK	5	LEAVING WATER TEMP	LWT
			RED	8		
			DRAIN	2		
	19	3	BLK	6	ENTERING WATER TEMP	EWT
			RED	9		
			DRAIN	3		
	19	2	BLK	4	OUTSIDE AIR TEMP.	OAT
			RED	7		
			DRAIN	1		
MICRO P7	19	5	RED	5	SYS #2 SUCTION PRESSURE	2SPT
			WHT	10		
			BLK	1		
			DRAIN	2		
	(OPTIONAL KIT)	7	RED	7	SYS #2 DISCHARGE PRESSURE	2DPT
			WHT	12		
			BLK	8		
			DRAIN	9		
MICRO P5	STANDARD 407C	15	RED	12	SYS #1 LIQ. TEMP. SENSOR	ILTS
			BLK	7		
			DRAIN	2		
	STANDARD 407C	16	RED	13	SYS #2 LIQ. TEMP. SENSOR	2LTS
			BLK	8		
			DRAIN	3		
	(OPTIONAL KIT)	8	RED	14	SYS #1 SUCTION TEMP. SENSOR	ISTS
			BLK	9		
			DRAIN	4		
	(OPTIONAL KIT)	9	RED	15	SYS #2 SUCTION TEMP. SENSOR	2STS
			BLK	10		
			DRAIN	5		
EEV OUTPUT BOARD AND TRANS FORMER 4T, 5T (OPTIONAL)	(OPTIONAL KIT)	10	BLK	4T (TRANS)	SYS #1 EEV OUTPUT	IEEV
			RED	EEV OUTPUT BOARD TB1-2		
	(OPTIONAL KIT)	11	BLK	5T (TRANS)	SYS #2 EEV OUTPUT	2EEV
			RED	EEV OUTPUT BOARD TB2-2		

NOTE: CABLES AND PLUGS (P4, P6 & P7) ARE SUPPLIED IN KIT (ITEM 19)



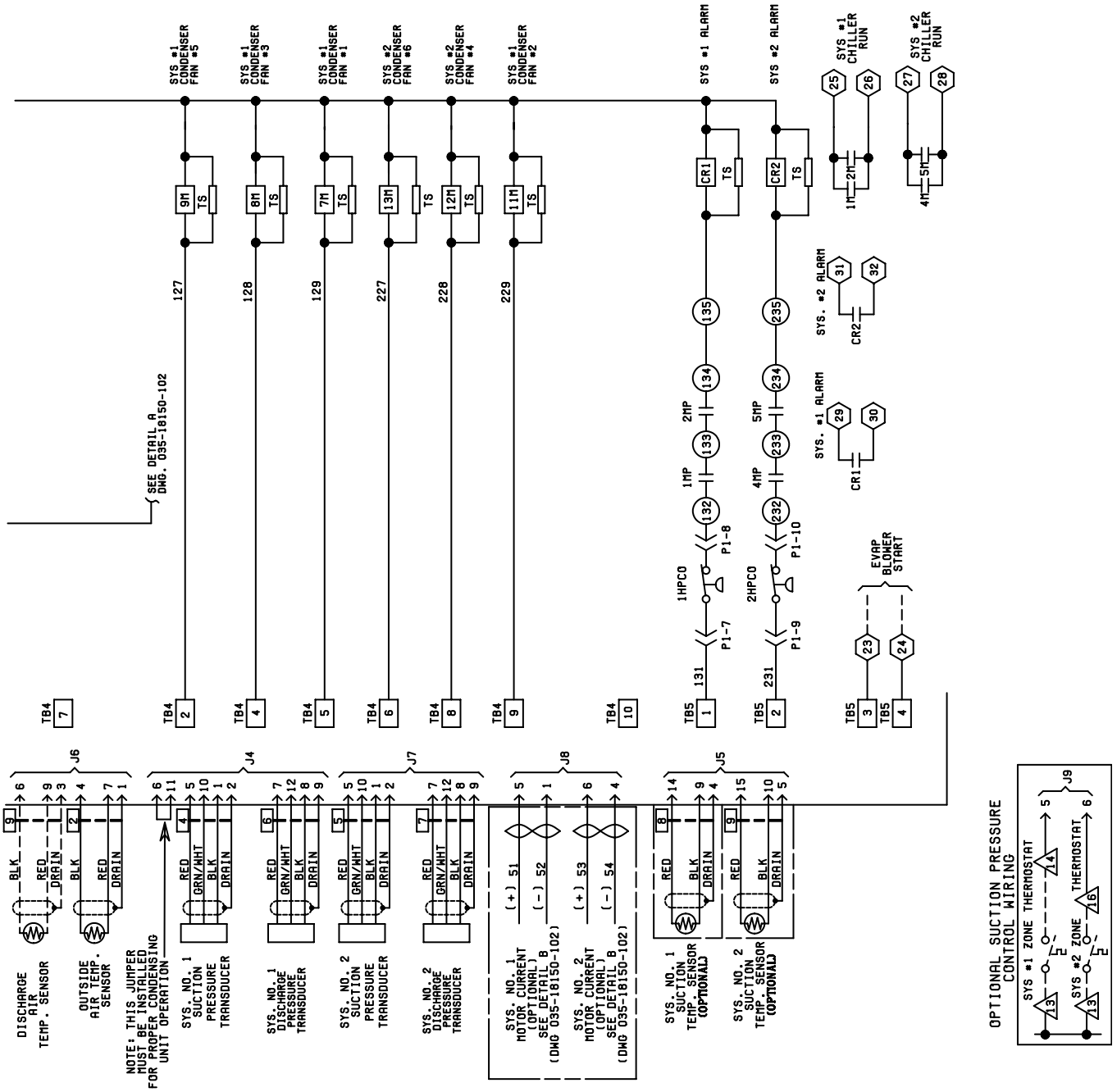
LD08806

ELEMENTARY DIAGRAM
CONDENSING UNITS
YCUL0096E_ – YCUL0100E_



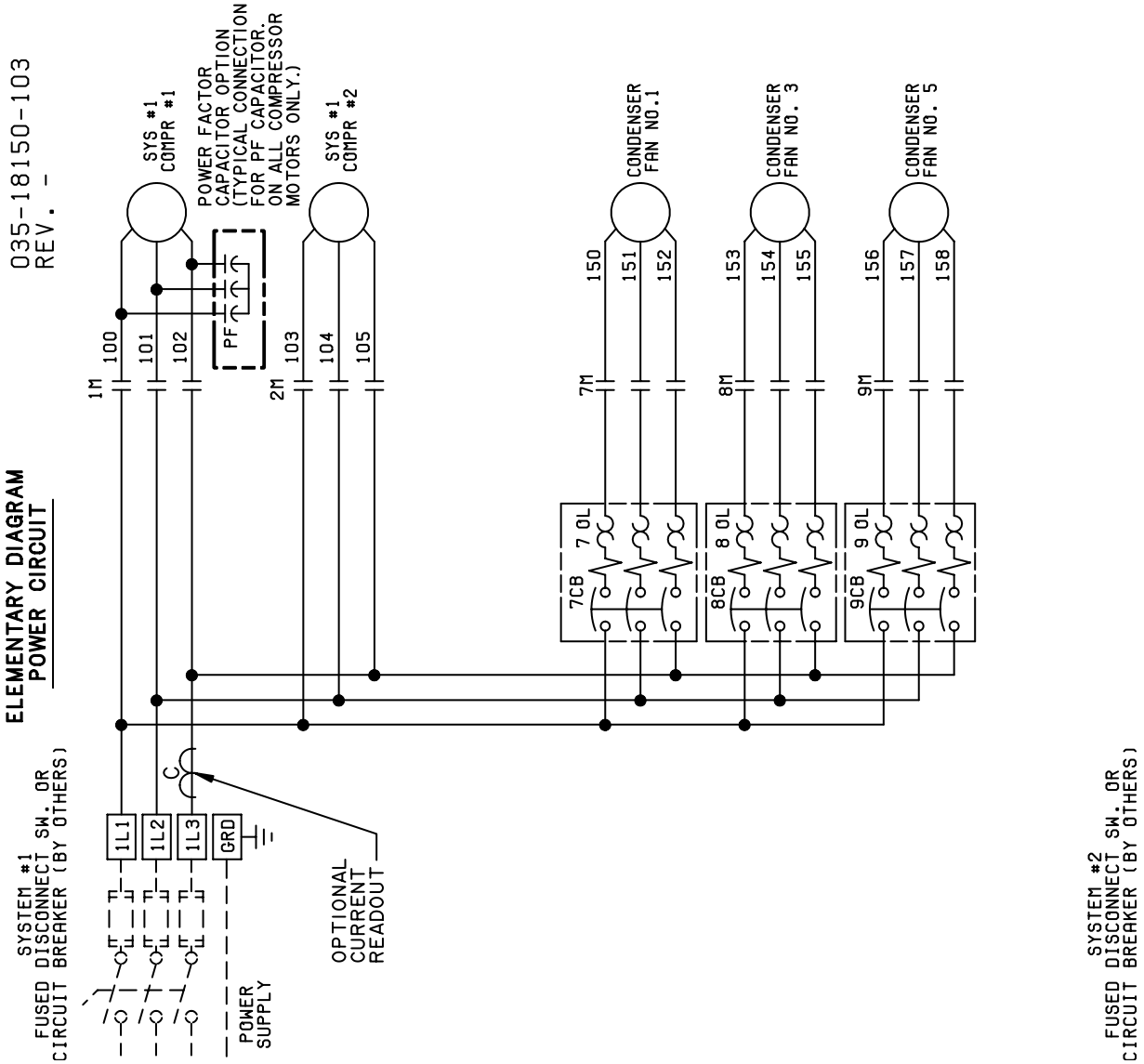
LD08792

FIG. 41 – ELEMENTARY DIAGRAM, CONTROL CIRCUIT – YCUL0096E_ - YCUL0100E_


SYS #1 CONDENSER FAN #5
SYS #1 CONDENSER FAN #3
SYS #1 CONDENSER FAN #1
SYS #2 CONDENSER FAN #6
SYS #2 CONDENSER FAN #4
SYS #1 CONDENSER FAN #2
SYS #1 ALARM
SYS #2 ALARM
SYS #1 CHILLER RUN
SYS #2 CHILLER RUN
SEE DETAIL A DWG. 035-18150-102
DISCHARGE AIR TEMP. SENSOR
OUTSIDE AIR TEMP. SENSOR
NOTE: THIS JUMPER MUST BE INSTALLED FOR PROPER CONDENSING UNIT OPERATION
SYS. NO. 1 SUCTION PRESSURE TRANSDUCER
SYS. NO. 1 DISCHARGE PRESSURE TRANSDUCER
SYS. NO. 2 SUCTION PRESSURE TRANSDUCER
SYS. NO. 2 DISCHARGE PRESSURE TRANSDUCER
SYS. NO. 1 MOTOR CURRENT (OPTIONAL) SEE DETAIL B (DWG 035-18150-102)
SYS. NO. 2 MOTOR CURRENT (OPTIONAL) SEE DETAIL B (DWG 035-18150-102)
SYS. NO. 1 SUCTION TEMP. SENSOR (OPTIONAL)
SYS. NO. 2 SUCTION TEMP. SENSOR (OPTIONAL)
1HPCO
2HPCO
EVAP BLOWER START
SYS. #1 ALARM
SYS. #2 ALARM
OPTIONAL SUCTION PRESSURE CONTROL WIRING
SYS #1 ZONE THERMOSTAT
SYS #2 ZONE THERMOSTAT

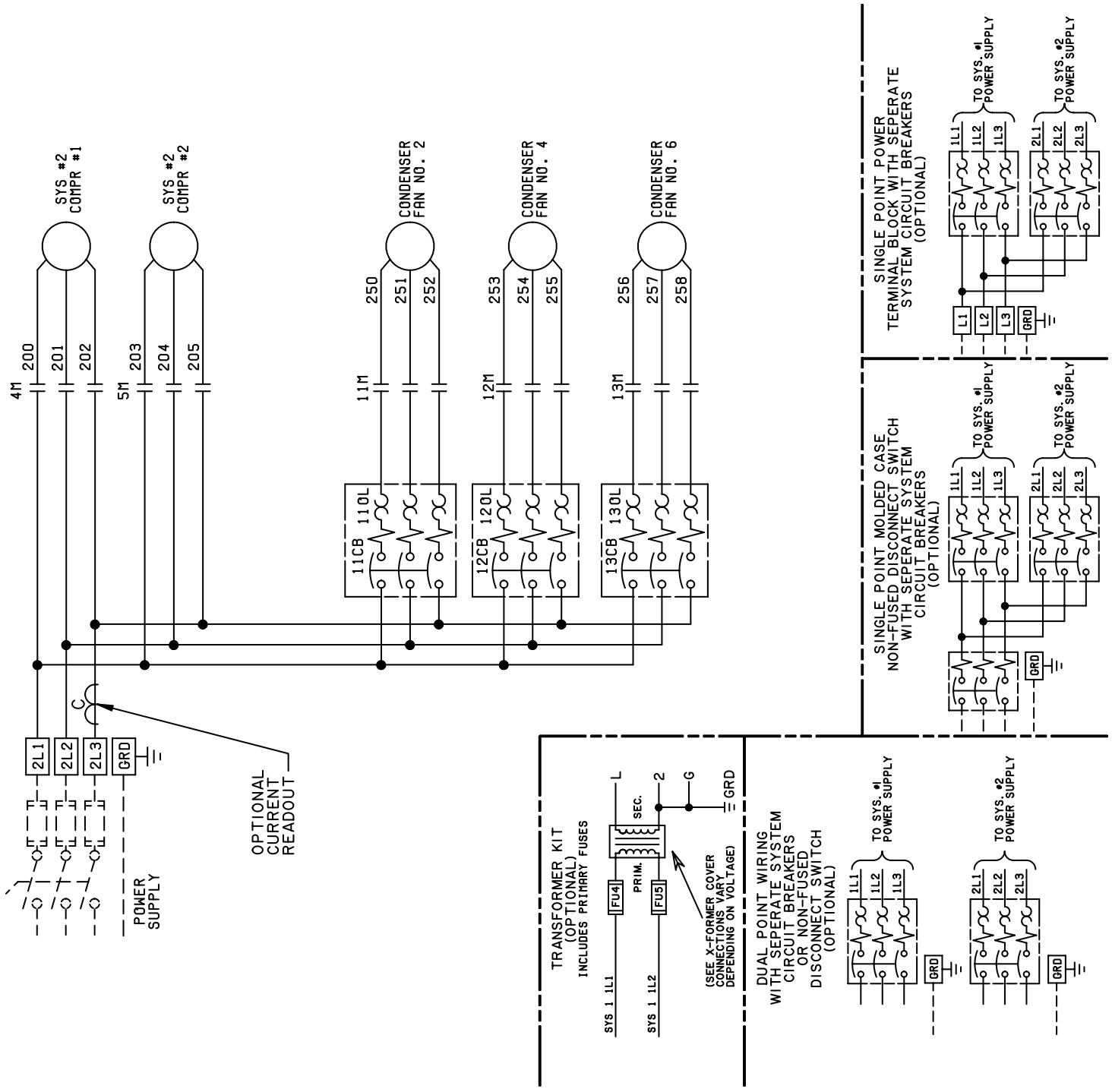
LD08810

ELEMENTARY DIAGRAM
YCUL0096E_ – YCUL0100E_



LD08790

FIG. 42 – ELEMENTARY DIAGRAM, POWER CIRCUIT – YCUL0096E_ - YCUL0100E_


SYS #2 COMPR #1
SYS #2 COMPR #2
CONDENSER FAN NO. 2
CONDENSER FAN NO. 4
CONDENSER FAN NO. 6
4M
5M
11M
12M
13M
200
201
202
203
204
205
250
251
252
253
254
255
256
257
258
11CB 110L
12CB 120L
13CB 130L
2L1
2L2
2L3
GRD
POWER SUPPLY
OPTIONAL CURRENT READOUT
SINGLE POINT POWER TERMINAL BLOCK WITH SEPERATE SYSTEM CIRCUIT BREAKERS (OPTIONAL)
SINGLE POINT MOLDED CASE NON-FUSED DISCONNECT SWITCH WITH SEPERATE SYSTEM CIRCUIT BREAKERS (OPTIONAL)
TO SYS. #1 POWER SUPPLY
TO SYS. #2 POWER SUPPLY
1L1
1L2
1L3
L1
L2
L3
TRANSFORMER KIT (OPTIONAL)
INCLUDES PRIMARY FUSES
SYS 1 1L1
SYS 1 1L2
FU4
FU5
PRIM.
SEC.
L
2
G
GRD
(SEE X-FORMER COVER CONNECTIONS VARY DEPENDING ON VOLTAGE)
DUAL POINT WIRING WITH SEPERATE SYSTEM CIRCUIT BREAKERS OR NON-FUSED DISCONNECT SWITCH (OPTIONAL)

LD08809

4

ELEMENTARY DIAGRAM
MIDDLE MARKET HIGH PERFORMANCE
YCUL0096E_ – YCUL0100E_

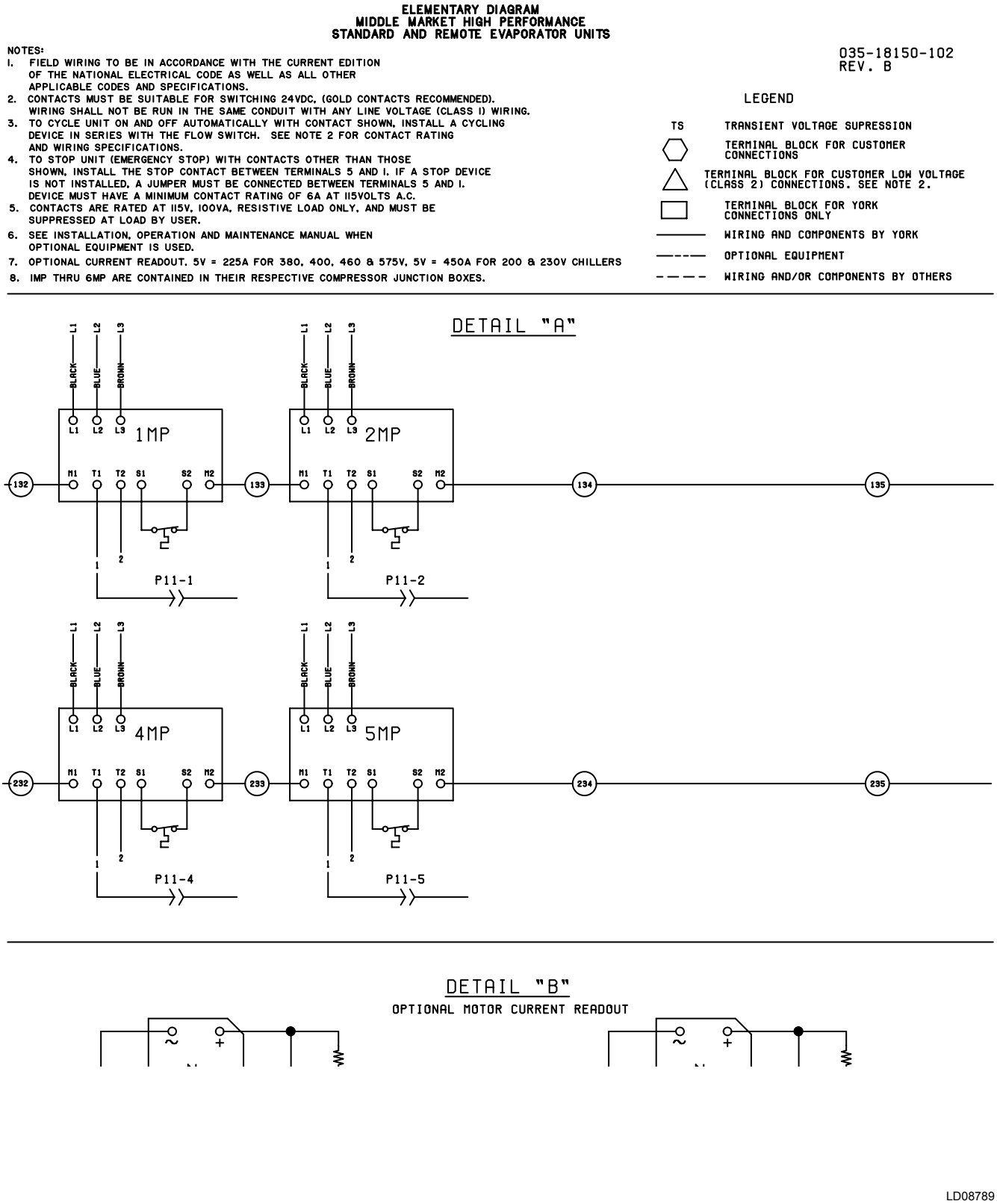


FIG. 43 – ELEMENTARY DIAGRAM, YCUL0096E_ - YCUL0100E_

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CONNECTION DIAGRAM
MIDDLE MARKET HIGH PERFORMANCE
CONDENSING UNITS
YCUL0096E_ – YCUL0100E_

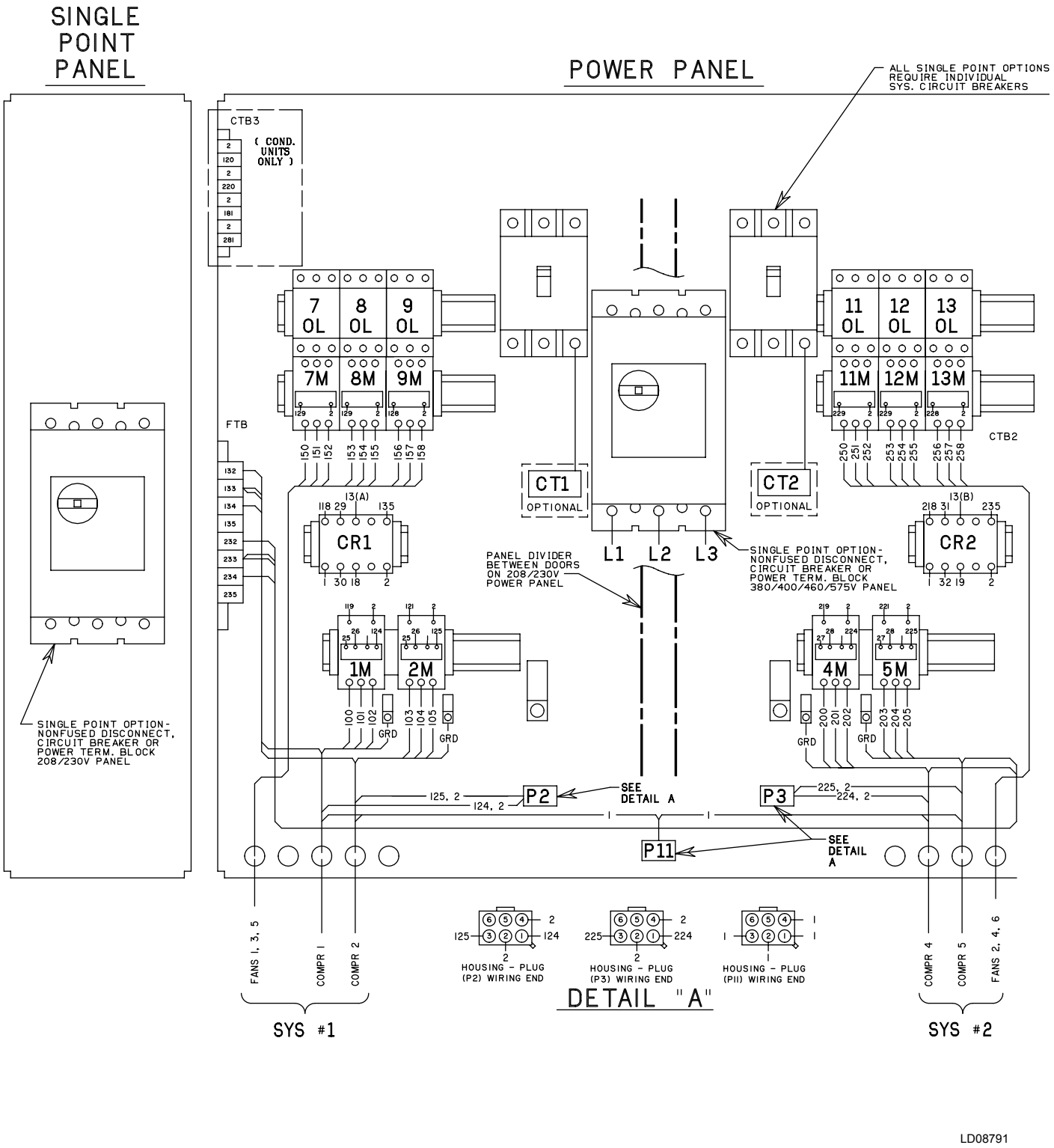
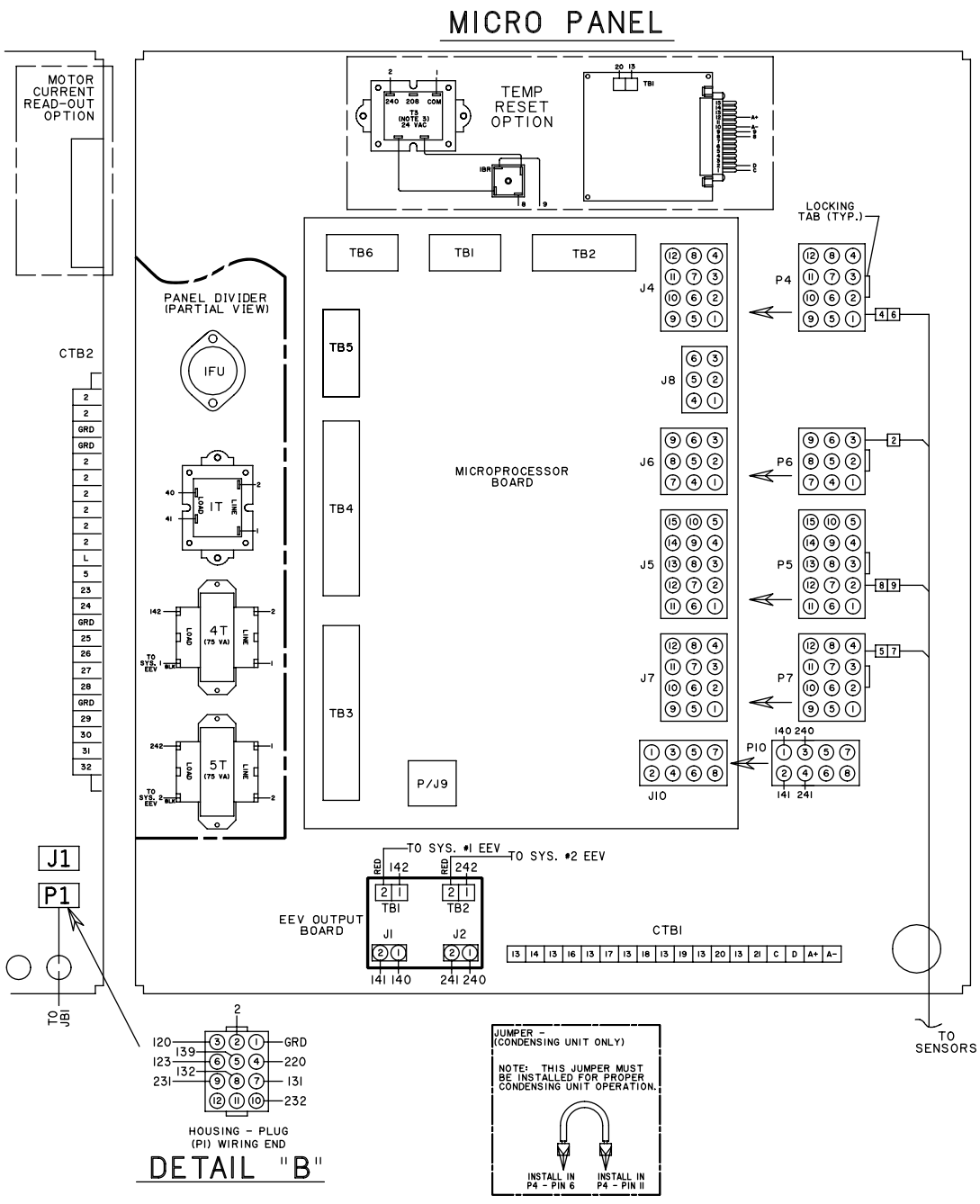


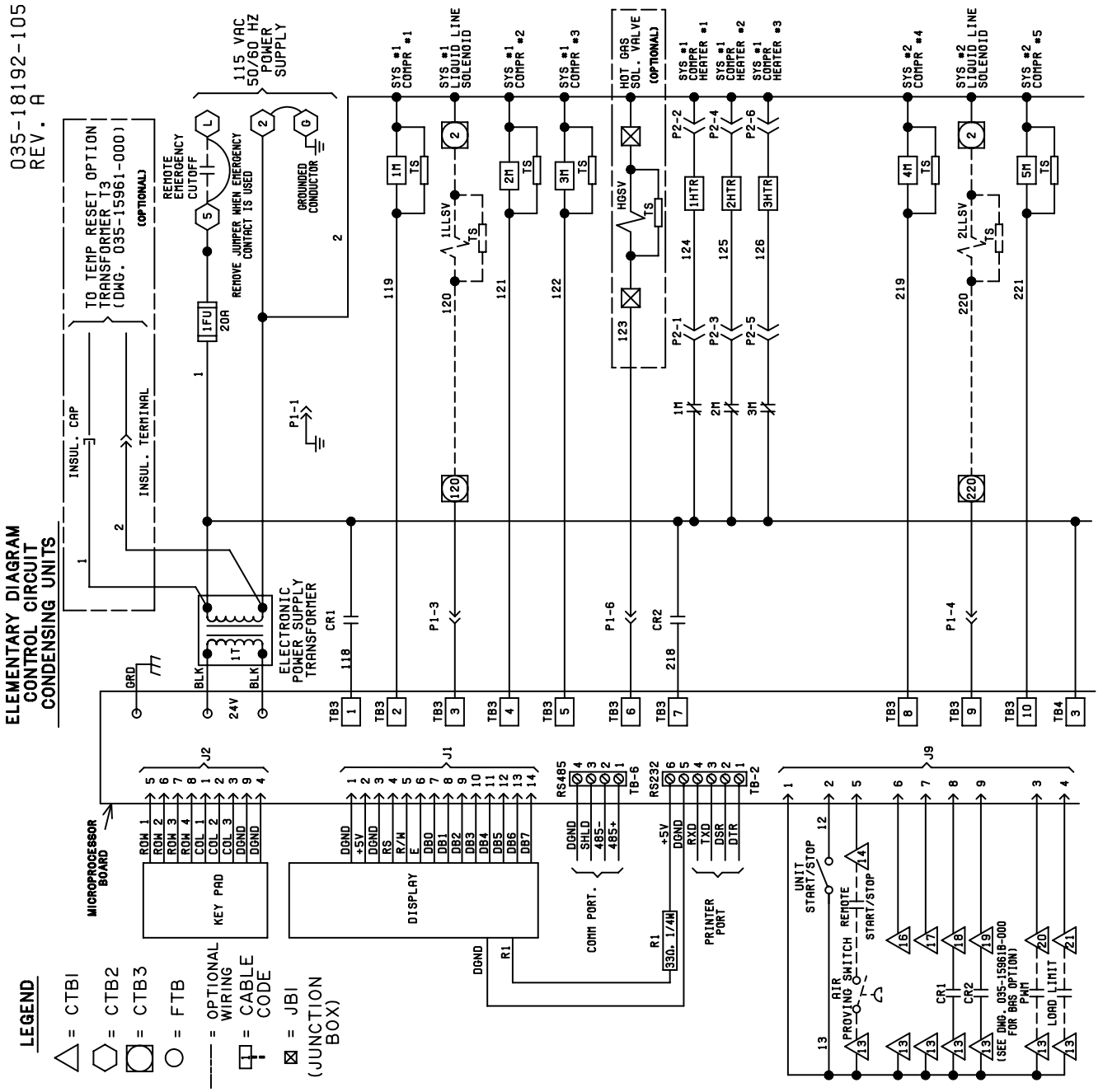
FIG. 44 – CONNECTION DIAGRAM, YCUL0096E_ - YCUL0100E_

035-18191-104
REV C



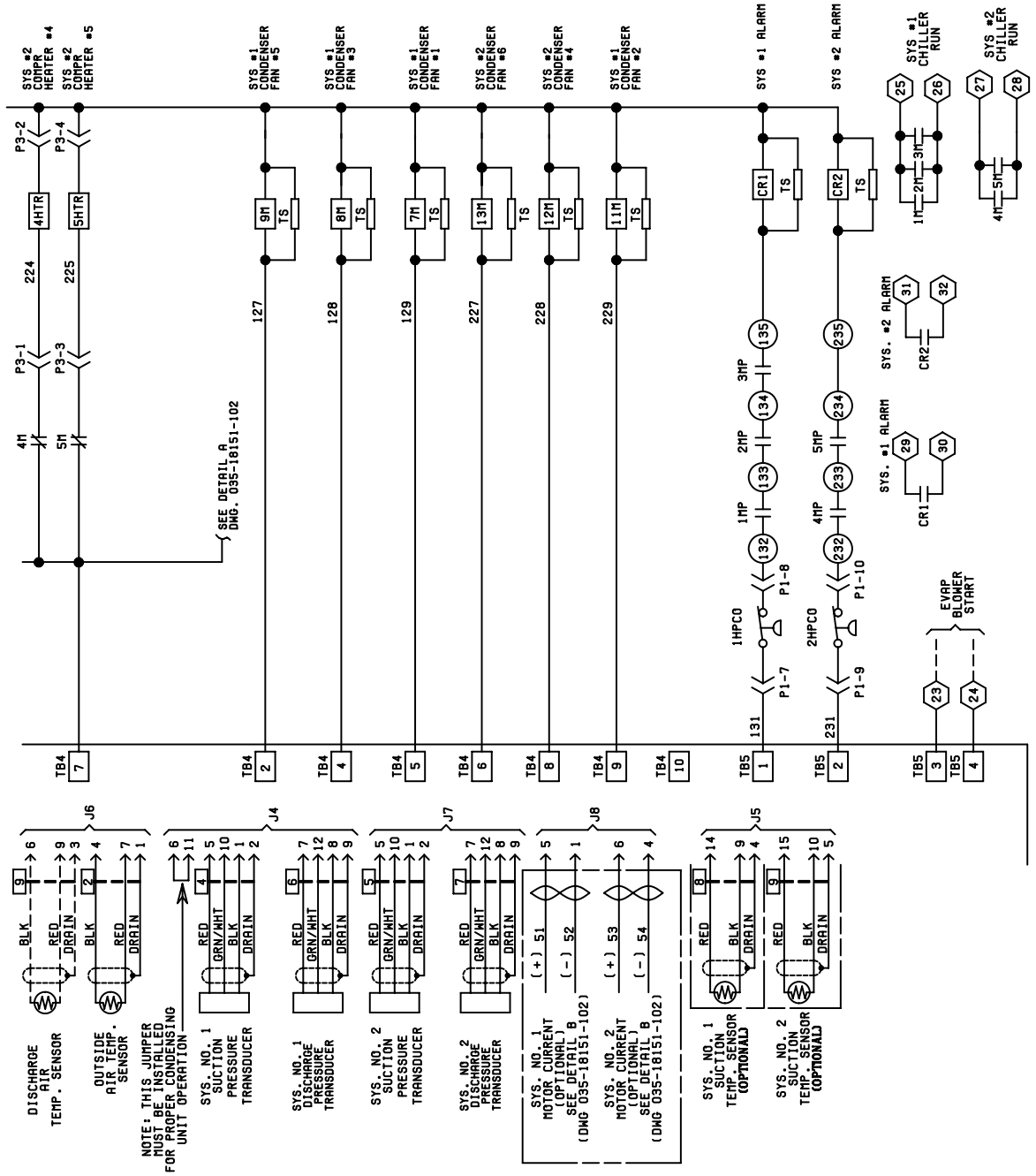
LD08808

ELEMENTARY DIAGRAM
CONDENSING UNITS
YCUL0106E_ – YCUL0106E_



LD08796

FIG. 45 – ELEMENTARY DIAGRAM, CONTROL CIRCUIT – YCUL0106E_ - YCUL0106E_


SYS #2 COMPR HEATER #4
SYS #2 COMPR HEATER #5
SYS #1 CONDENSER FAN #5
SYS #1 CONDENSER FAN #3
SYS #1 CONDENSER FAN #1
SYS #2 CONDENSER FAN #6
SYS #2 CONDENSER FAN #4
SYS #1 CONDENSER FAN #2
SYS #1 ALARM
SYS #2 ALARM
SYS #1 CHILLER RUN
SYS #2 CHILLER RUN
P3-2
P3-4
P3-1
P3-3
4HTR
5HTR
4M
5M
224
225
127
128
129
227
228
229
9M
8M
7M
13M
12M
11M
TS
CR1
CR2
3MP
2MP
1MP
5MP
4MP
135
134
133
235
234
233
232
131
231
1HPCO
2HPCO
P1-8
P1-10
P1-7
P1-9
SEE DETAIL A DWG. 035-18151-102
SYS. #1 ALARM
SYS. #2 ALARM
EVAP BLOWER START
TB4
TB5
J4
J5
J6
J7
J8
DISCHARGE AIR TEMP. SENSOR
OUTSIDE AIR TEMP. SENSOR
NOTE: THIS JUMPER MUST BE INSTALLED FOR PROPER CONDENSING UNIT OPERATION
SYS. NO. 1 SUCTION PRESSURE TRANSDUCER
SYS. NO. 1 DISCHARGE PRESSURE TRANSDUCER
SYS. NO. 2 SUCTION PRESSURE TRANSDUCER
SYS. NO. 2 DISCHARGE PRESSURE TRANSDUCER
SYS. NO. 1 MOTOR CURRENT (OPTIONAL) SEE DETAIL B (DWG 035-18151-102)
SYS. NO. 2 MOTOR CURRENT (OPTIONAL) SEE DETAIL B (DWG 035-18151-102)
SYS. NO. 1 SUCTION TEMP. SENSOR (OPTIONAL)
SYS. NO. 2 SUCTION TEMP. SENSOR (OPTIONAL)
RED
BLK
GRN/WHT
DRAIN
(+) 51
(-) 52
(+) 53
(-) 54
OPTIONAL SUCTION PRESSURE CONTROL WIRING
SYS #1 ZONE THERMOSTAT
SYS #2 ZONE THERMOSTAT
J9

LD08819

ELEMENTARY DIAGRAM
YCUL0106E_ – YCUL0106E_

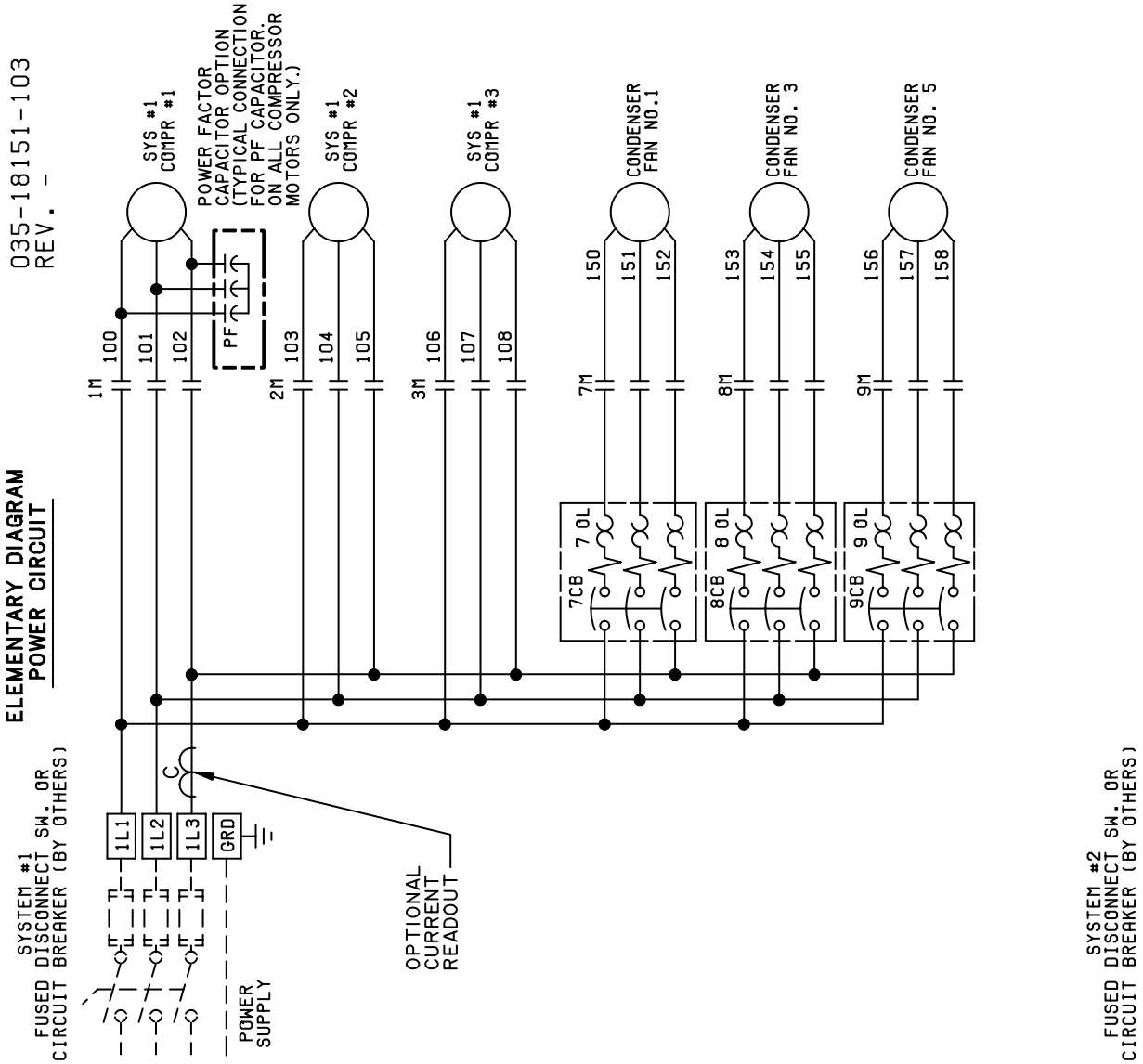
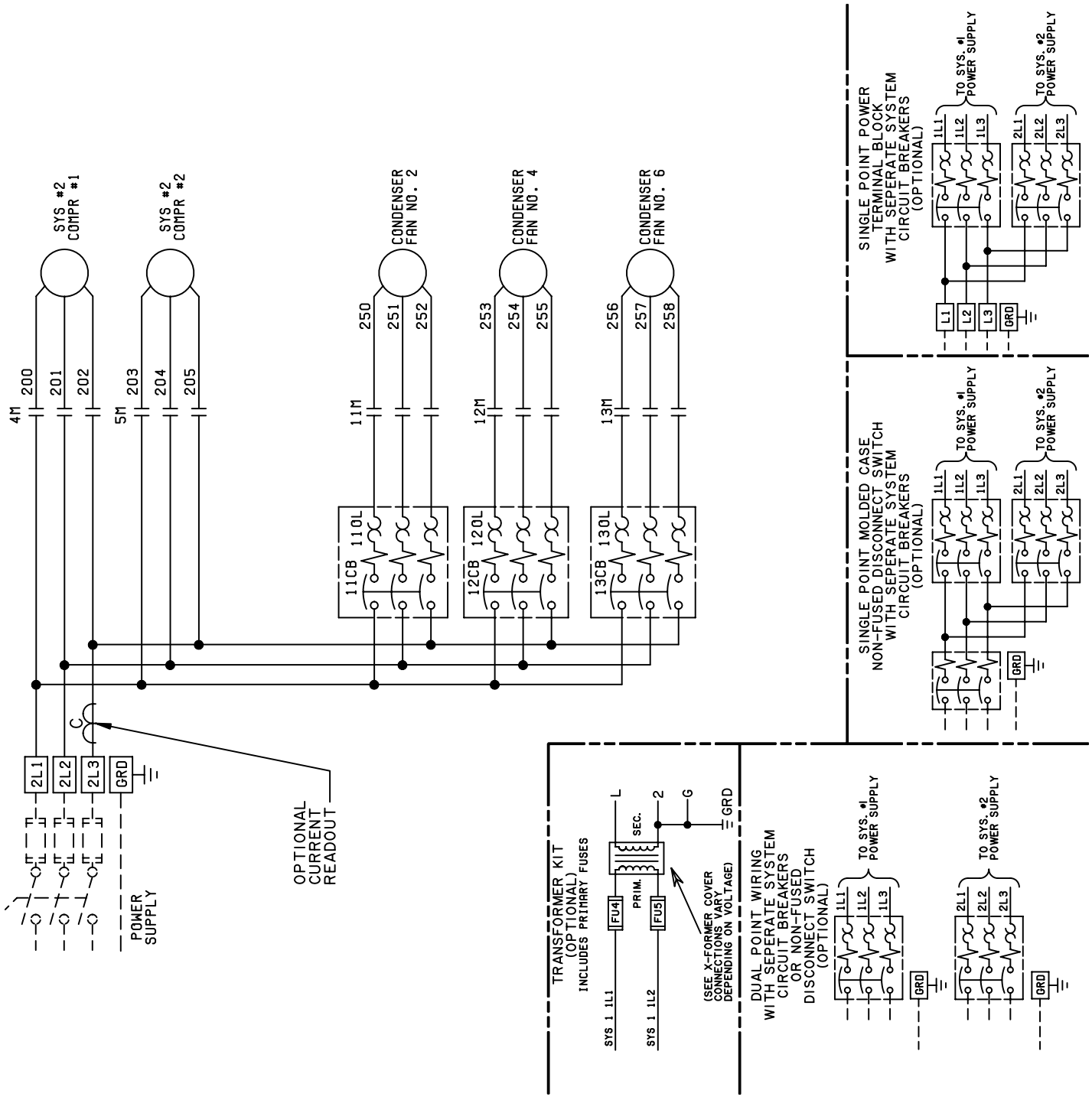


FIG. 46 – ELEMENTARY DIAGRAM, POWER CIRCUIT – YCUL0106E_ - YCUL0106E_


SYS #2 COMPR #1
SYS #2 COMPR #2
CONDENSER FAN NO. 2
CONDENSER FAN NO. 4
CONDENSER FAN NO. 6
4M 200 201 202
5M 203 204 205
11M 250 251 252
12M 253 254 255
13M 256 257 258
11CB 110L
12CB 120L
13CB 130L
2L1 2L2 2L3 GRD
POWER SUPPLY
OPTIONAL CURRENT READOUT
TRANSFORMER KIT (OPTIONAL) INCLUDES PRIMARY FUSES
PRIM. SEC.
FU4 FU5
L 2 G GRD
SYS 1 1L1
SYS 1 1L2
(SEE X-FORMER COVER CONNECTIONS VARY DEPENDING ON VOLTAGE)
DUAL POINT WIRING WITH SEPERATE SYSTEM CIRCUIT BREAKERS OR NON-FUSED DISCONNECT SWITCH (OPTIONAL)
SINGLE POINT MOLDED CASE NON-FUSED DISCONNECT SWITCH WITH SEPERATE SYSTEM CIRCUIT BREAKERS (OPTIONAL)
SINGLE POINT POWER TERMINAL BLOCK WITH SEPERATE SYSTEM CIRCUIT BREAKERS (OPTIONAL)
1L1 1L2 1L3 GRD
2L1 2L2 2L3
TO SYS. #1 POWER SUPPLY
TO SYS. #2 POWER SUPPLY
L1 L2 L3 GRD

LD08817

ELEMENTARY DIAGRAM
MIDDLE MARKET HIGH PERFORMANCE
YCUL0106E_ – YCUL0106E_

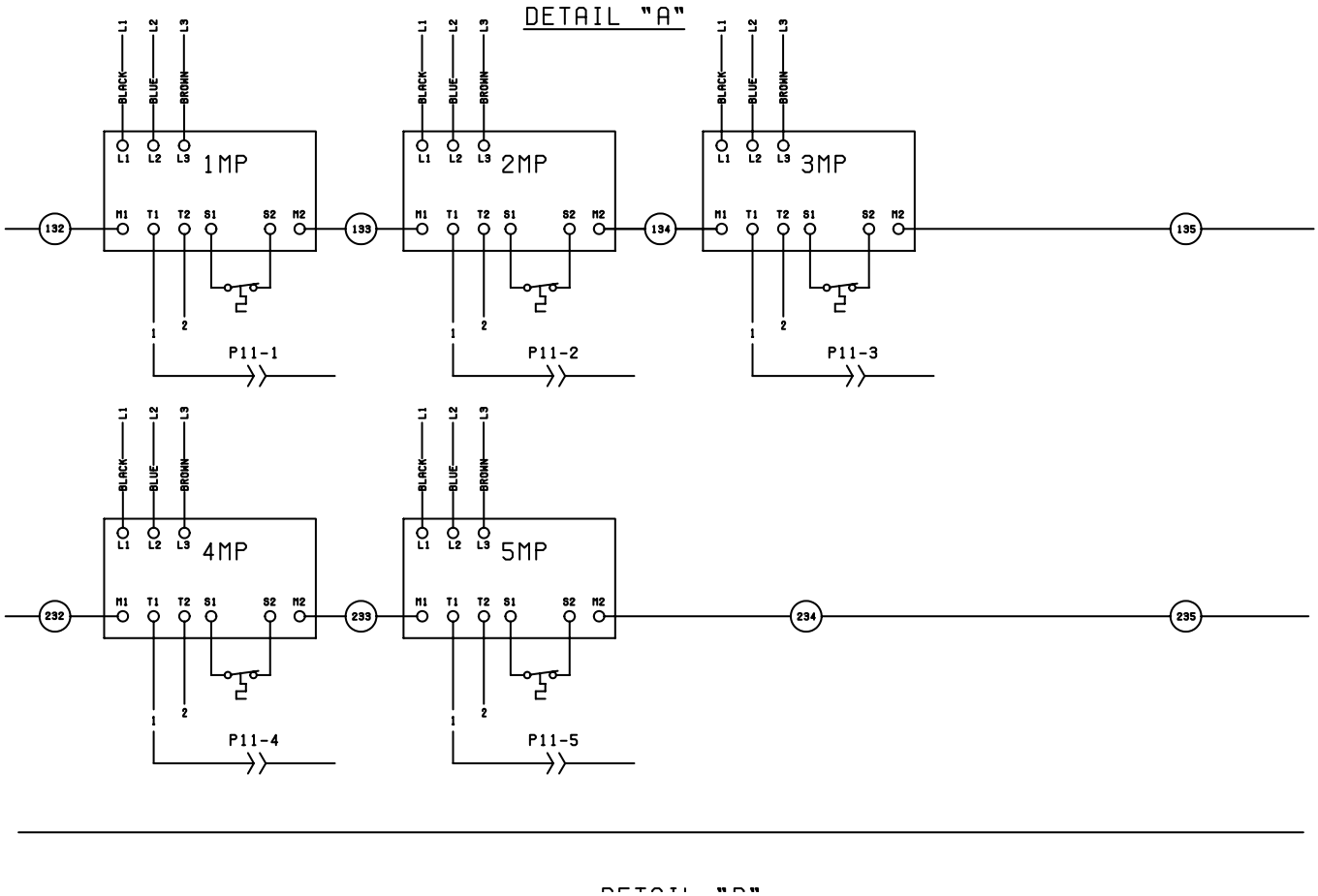
ELEMENTARY DIAGRAM
MIDDLE MARKET HIGH PERFORMANCE
STANDARD AND REMOTE EVAPORATOR UNITS

035-18151-102
REV. B

NOTES:
1. FIELD WIRING TO BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS ALL OTHER APPLICABLE CODES AND SPECIFICATIONS.
2. CONTACTS MUST BE SUITABLE FOR SWITCHING 24VDC, (GOLD CONTACTS RECOMMENDED). WIRING SHALL NOT BE RUN IN THE SAME CONDUIT WITH ANY LINE VOLTAGE (CLASS 1) WIRING.
3. TO CYCLE UNIT ON AND OFF AUTOMATICALLY WITH CONTACT SHOWN, INSTALL A CYCLING DEVICE IN SERIES WITH THE FLOW SWITCH. SEE NOTE 2 FOR CONTACT RATING AND WIRING SPECIFICATIONS.
4. TO STOP UNIT (EMERGENCY STOP) WITH CONTACTS OTHER THAN THOSE SHOWN, INSTALL THE STOP CONTACT BETWEEN TERMINALS 5 AND 1. IF A STOP DEVICE IS NOT INSTALLED, A JUMPER MUST BE CONNECTED BETWEEN TERMINALS 5 AND 1. DEVICE MUST HAVE A MINIMUM CONTACT RATING OF 6A AT 115VOLTS A.C.
5. CONTACTS ARE RATED AT 115V, 100VA, RESISTIVE LOAD ONLY, AND MUST BE SUPPRESSED AT LOAD BY USER.
6. SEE INSTALLATION, OPERATION AND MAINTENANCE MANUAL WHEN OPTIONAL EQUIPMENT IS USED.
7. OPTIONAL CURRENT READOUT. 5V = 225A FOR 380, 400, 460 & 575V, 5V = 450A FOR 200 & 230V CHILLERS
8. 1MP THRU 6MP ARE CONTAINED IN THEIR RESPECTIVE COMPRESSOR JUNCTION BOXES.

LEGEND

TS	TRANSIENT VOLTAGE SUPRESSION
⬡	TERMINAL BLOCK FOR CUSTOMER CONNECTIONS
△	TERMINAL BLOCK FOR CUSTOMER LOW VOLTAGE (CLASS 2) CONNECTIONS. SEE NOTE 2.
▭	TERMINAL BLOCK FOR YORK CONNECTIONS ONLY
———	WIRING AND COMPONENTS BY YORK
——–——	OPTIONAL EQUIPMENT
– – – –	WIRING AND/OR COMPONENTS BY OTHERS



LD08793

FIG. 47 – ELEMENTARY DIAGRAM, YCUL0106E_ - YCUL0106E_

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CONNECTION DIAGRAM
MIDDLE MARKET HIGH PERFORMANCE
CONDENSING UNITS
YCUL0106E_ – YCUL0106E_

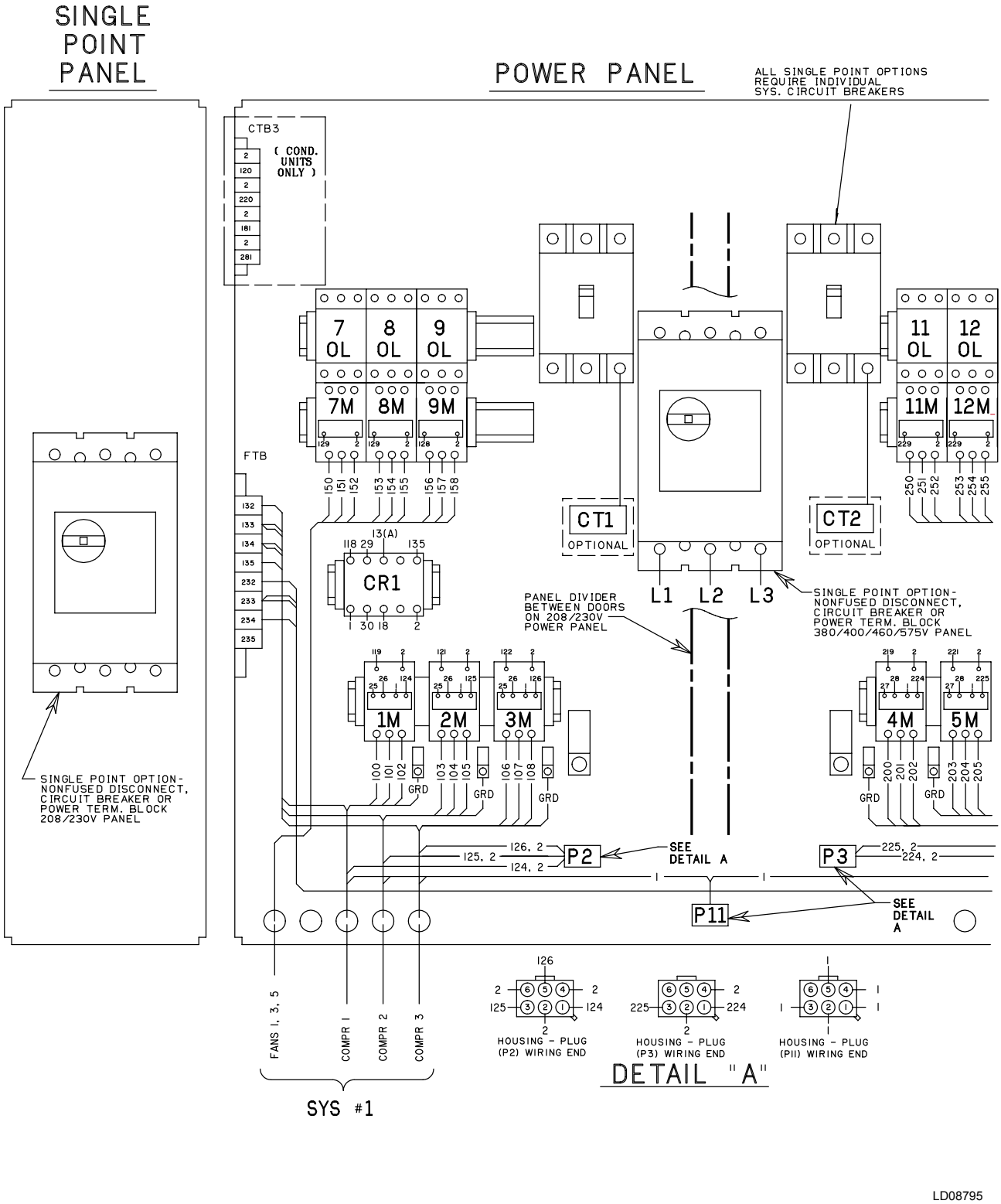
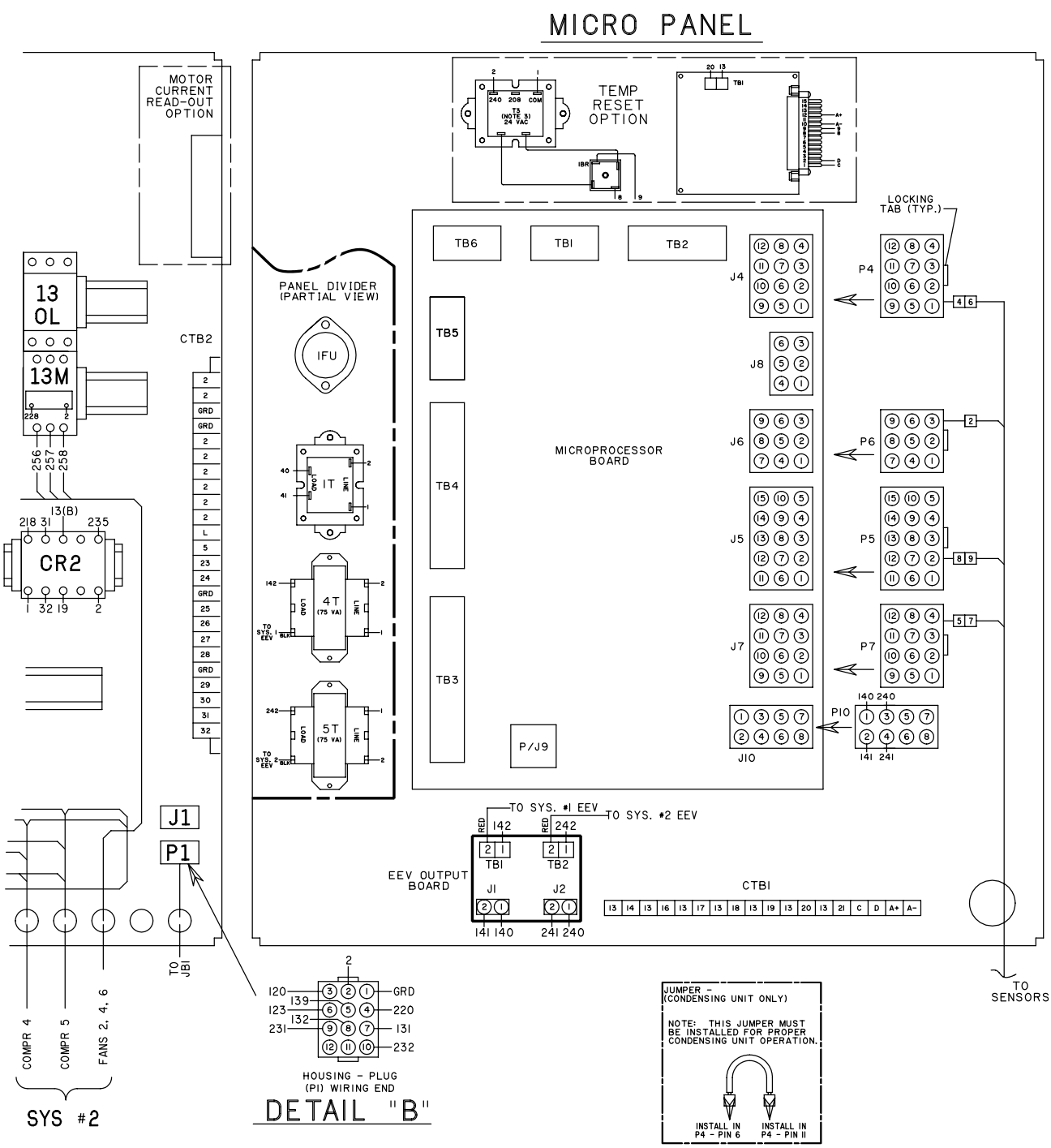


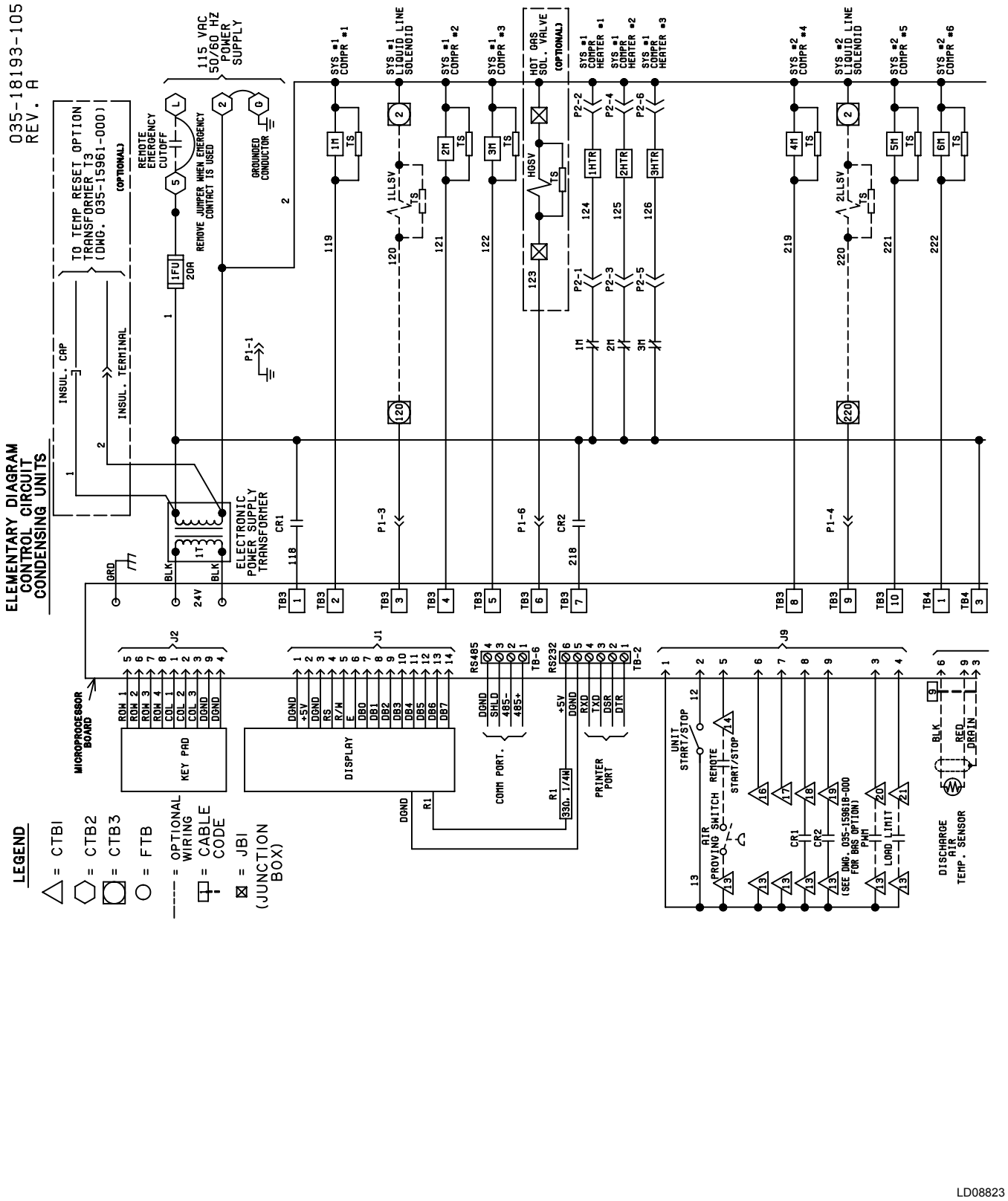
FIG. 48 – CONNECTION DIAGRAM, YCUL0106E_ - YCUL0106E_

035-18192-104
REV C



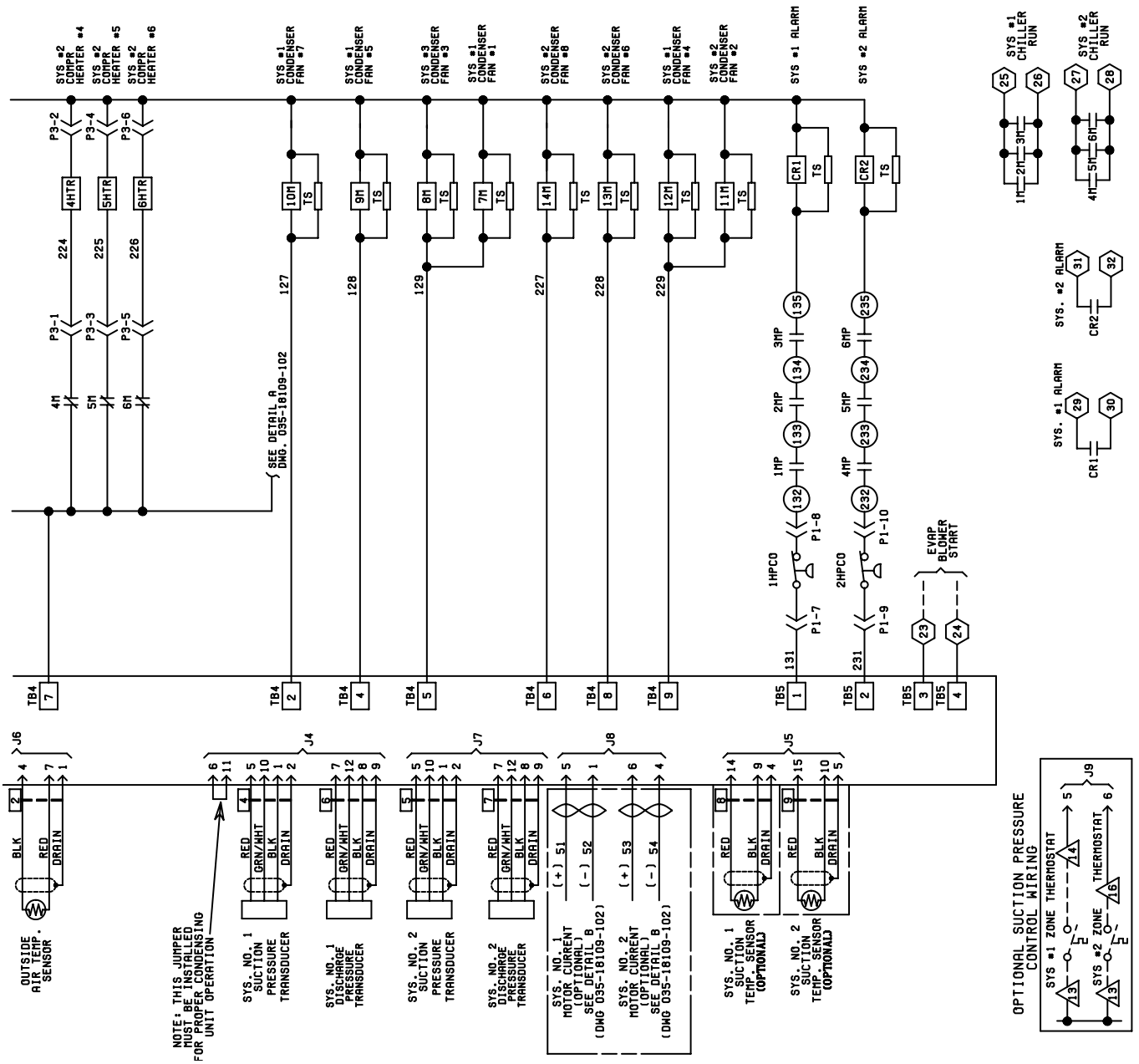
LD08818

ELEMENTARY DIAGRAM
CONDENSING UNITS
YCUL0120E_ – YCUL0130E_



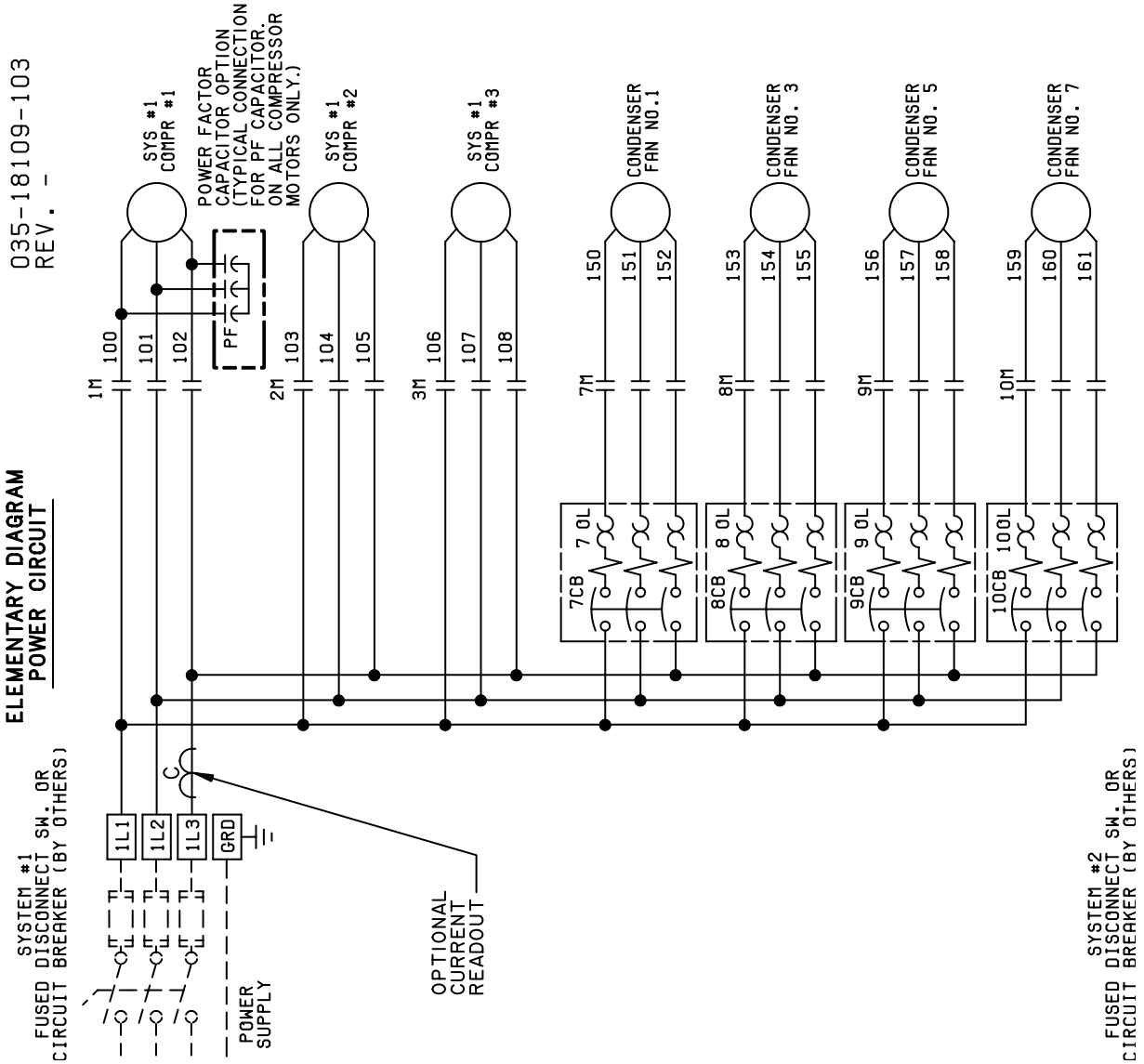
LD08823

FIG. 49 – ELEMENTARY DIAGRAM, CONTROL CIRCUIT – YCUL0120E_ - YCUL0130E_


SYS #2 COPPER HEATER #4
SYS #2 COPPER HEATER #5
SYS #2 COPPER HEATER #6
SYS #1 CONDENSER FAN #7
SYS #1 CONDENSER FAN #5
SYS #3 CONDENSER FAN #3
SYS #1 CONDENSER FAN #1
SYS #2 CONDENSER FAN #8
SYS #2 CONDENSER FAN #6
SYS #1 CONDENSER FAN #4
SYS #2 CONDENSER FAN #2
SYS #1 ALARM
SYS #2 ALARM
SYS #1 CHILLER RUN
SYS #2 CHILLER RUN
P3-1
P3-2
P3-3
P3-4
P3-5
P3-6
4M
5M
6M
4HTR
5HTR
6HTR
224
225
226
SEE DETAIL A DWG. 035-18109-102
127
128
129
227
228
229
10M
9M
8M
7M
14M
13M
12M
11M
TS
CR1
CR2
1HPCO
2HPCO
P1-7
P1-8
P1-9
P1-10
1MP
2MP
3MP
4MP
5MP
6MP
131
132
133
134
135
231
232
233
234
235
EVAP BLOWER START
TB4
TB5
J6
J4
J7
J8
J5
J9
OUTSIDE AIR TEMP. SENSOR
BLK
RED
DRAIN
NOTE: THIS JUMPER MUST BE INSTALLED FOR PROPER CONDENSING UNIT OPERATION
SYS. NO. 1 SUCTION PRESSURE TRANSDUCER
SYS. NO. 1 DISCHARGE PRESSURE TRANSDUCER
SYS. NO. 2 SUCTION PRESSURE TRANSDUCER
SYS. NO. 2 DISCHARGE PRESSURE TRANSDUCER
GRN/WHT
BLK
SYS. NO. 1 MOTOR CURRENT (OPTIONAL) SEE DETAIL B (DWG 035-18109-102)
SYS. NO. 2 MOTOR CURRENT (OPTIONAL) SEE DETAIL B (DWG 035-18109-102)
(+) 51
(-) 52
(+) 53
(-) 54
SYS. NO. 1 SUCTION TEMP. SENSOR (OPTIONAL)
SYS. NO. 2 SUCTION TEMP. SENSOR (OPTIONAL)
OPTIONAL SUCTION PRESSURE CONTROL WIRING
SYS #1 ZONE THERMOSTAT
SYS #2 ZONE THERMOSTAT
THERMOSTAT

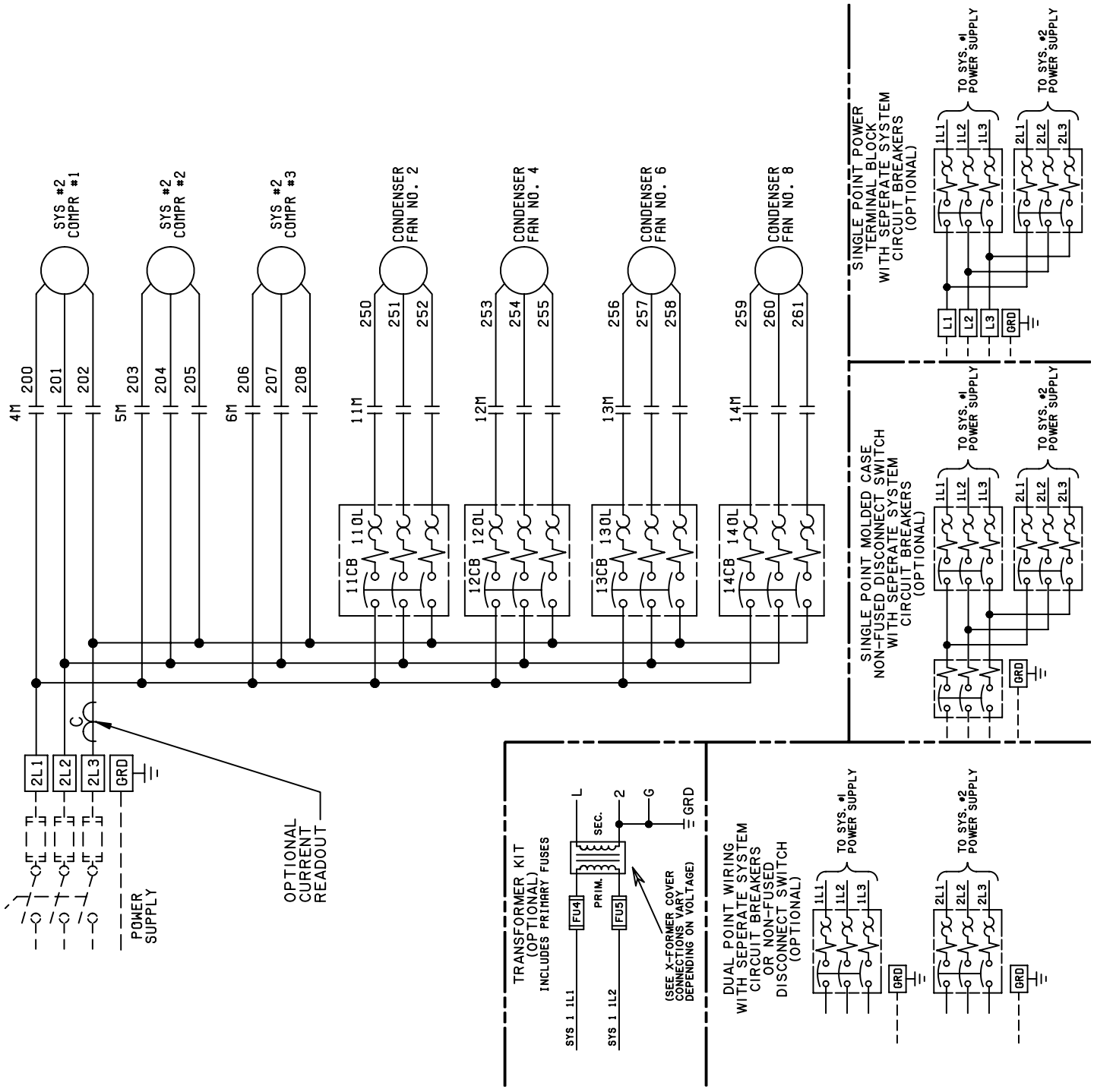
LD08822

ELEMENTARY DIAGRAM
YCUL0120E_ – YCUL0130E_



LD08798

FIG. 50 – ELEMENTARY DIAGRAM, POWER CIRCUIT – YCUL0120E_ - YCUL0130E_


SYS #2 COMPR #1
SYS #2 COMPR #2
SYS #2 COMPR #3
CONDENSER FAN NO. 2
CONDENSER FAN NO. 4
CONDENSER FAN NO. 6
CONDENSER FAN NO. 8
4M 200 201 202
5M 203 204 205
6M 206 207 208
11M 250 251 252
12M 253 254 255
13M 256 257 258
14M 259 260 261
11CB 110L
12CB 120L
13CB 130L
14CB 140L
2L1 2L2 2L3 GRD
POWER SUPPLY
OPTIONAL CURRENT READOUT
SINGLE POINT POWER TERMINAL BLOCK WITH SEPERATE SYSTEM CIRCUIT BREAKERS (OPTIONAL)
SINGLE POINT MOLDED CASE NON-FUSED DISCONNECT SWITCH WITH SEPERATE SYSTEM CIRCUIT BREAKERS (OPTIONAL)
TO SYS. #1 POWER SUPPLY
TO SYS. #2 POWER SUPPLY
1L1 1L2 1L3
2L1 2L2 2L3
L1 L2 L3 GRD
TRANSFORMER KIT (OPTIONAL)
INCLUDES PRIMARY FUSES
SYS 1 1L1
SYS 1 1L2
FU4
FU5
PRIM.
SEC.
L
2
G
GRD
(SEE X-FORMER COVER CONNECTIONS VARY DEPENDING ON VOLTAGE)
DUAL POINT WIRING WITH SEPERATE SYSTEM CIRCUIT BREAKERS OR NON-FUSED DISCONNECT SWITCH (OPTIONAL)

LD08820

4

ELEMENTARY DIAGRAM
MIDDLE MARKET HIGH PERFORMANCE
YCUL0120E_ – YCUL0130E_

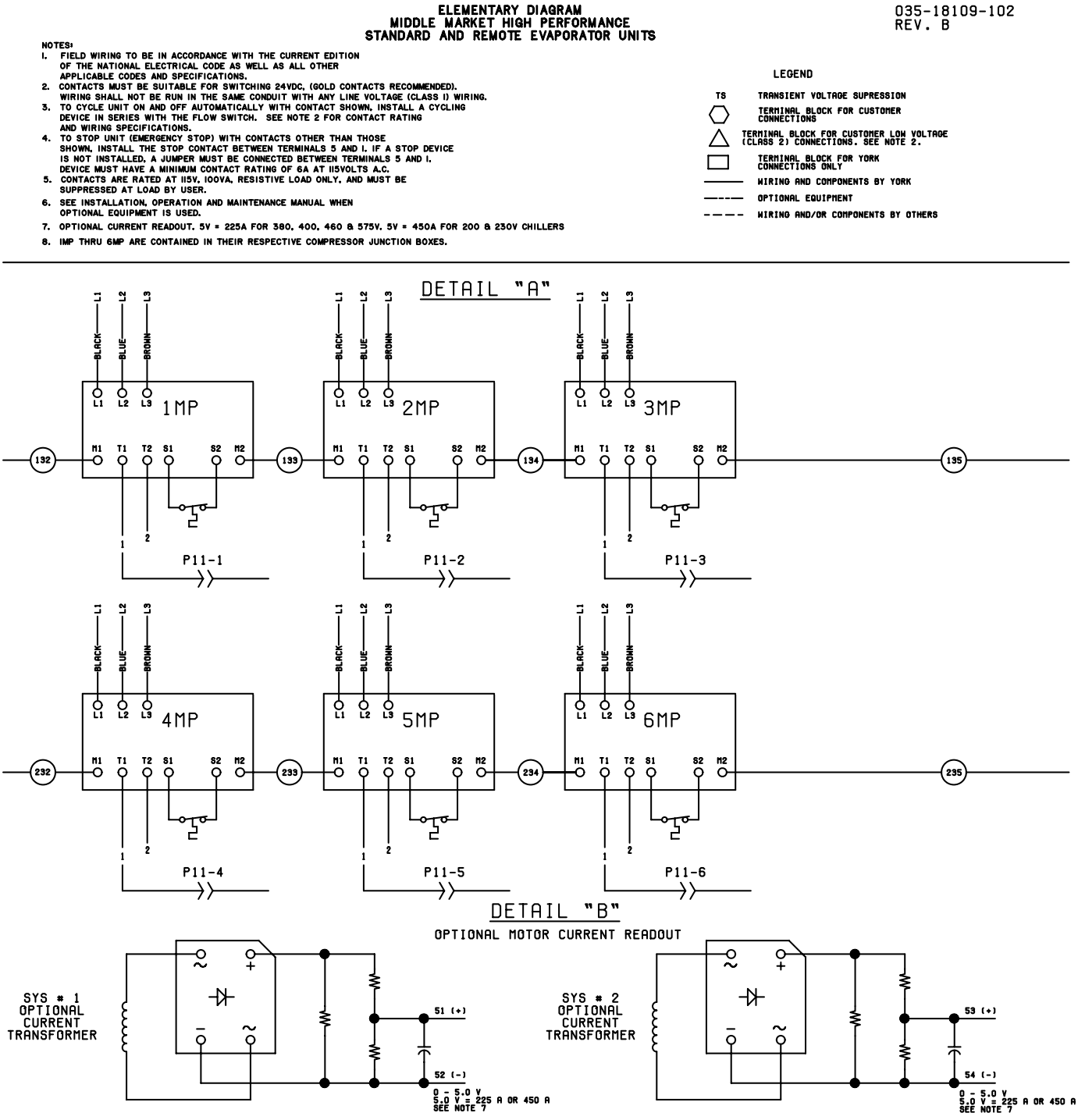


FIG. 51 – ELEMENTARY DIAGRAM, YCUL0120E_ - YCUL0130E_

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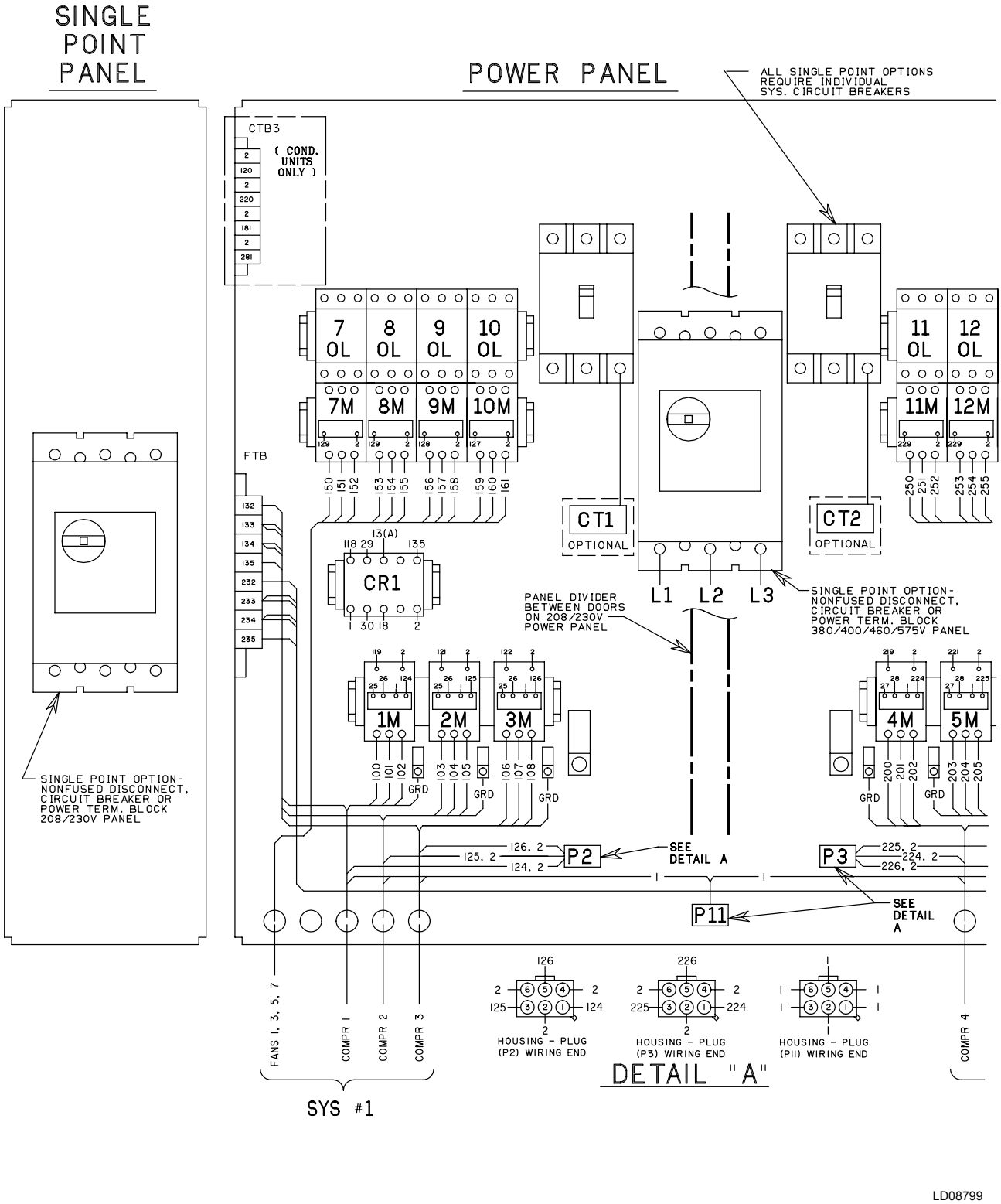
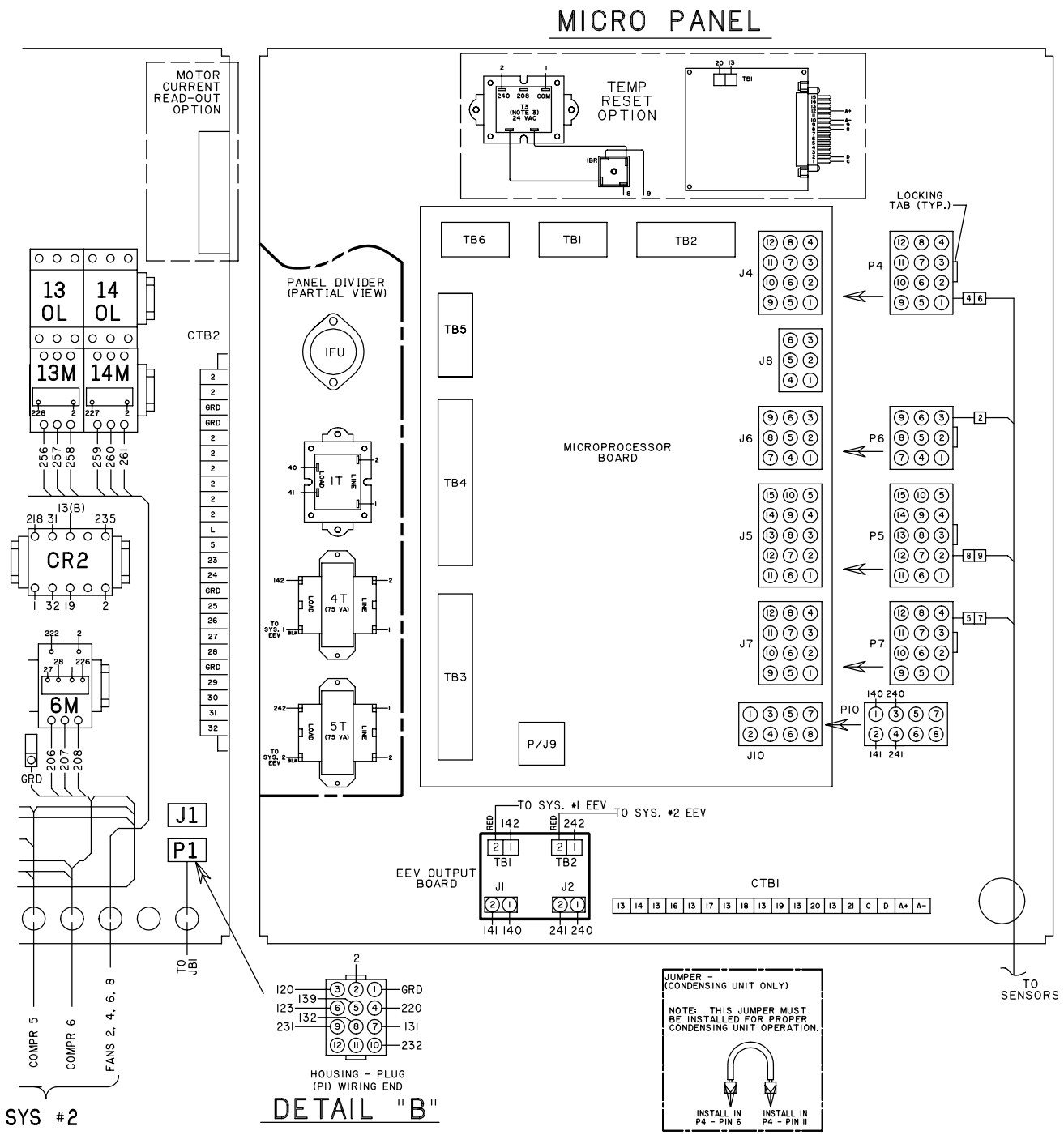
CONNECTION DIAGRAM
MIDDLE MARKET HIGH PERFORMANCE
CONDENSING UNITS
YCUL0120E_ – YCUL0130E_



LD08799

FIG. 52 – CONNECTION DIAGRAM, YCUL0120E_ - YCUL0130E_

035-18193-104
REV C



LD08821

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